THE BOY WITH THE U. S. LIFE SAVERS

FRANCIS ROLT-WHEELER

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THE BOY WITH THE U. S. LIFE-SAVERS

BOOKS BY FRANCIS ROLT-WHEELER

U. S. Service Series

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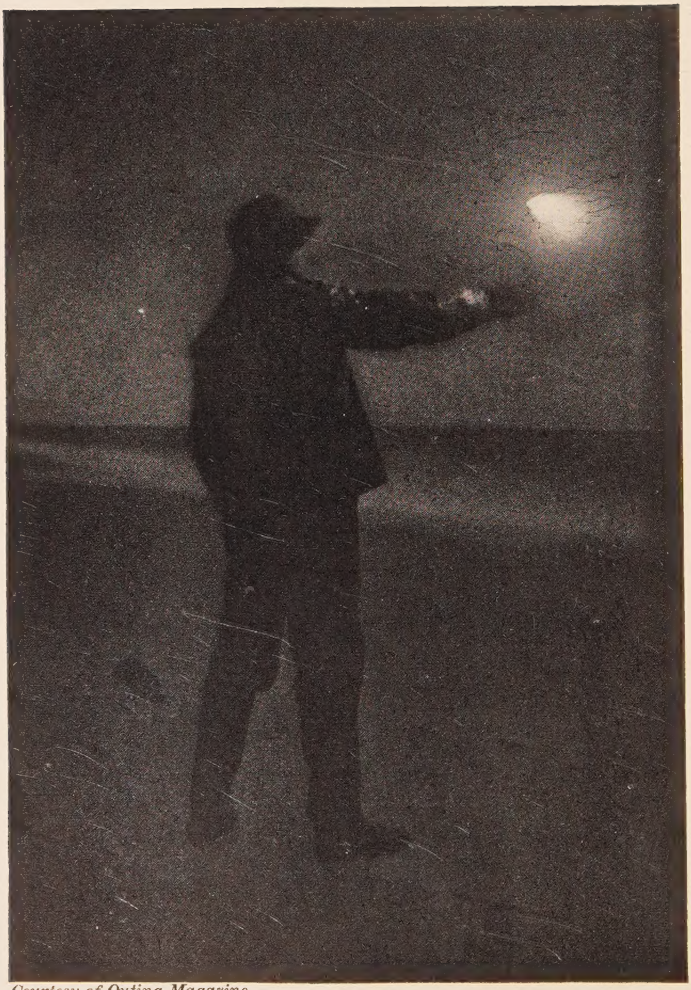

Courtesy of Outing Magazine.

THE GLEAM THAT BRINGS HOPE.

Coast Guard patrol burning the Coston Light as signal to wrecked vessel that help is at hand.

U. S. SERVICE SERIES.

THE BOY WITH THE U. S. LIFE-SAVERS

BY

FRANCIS ROLT-WHEELER

With Forty-eight Illustrations, nearly all from Photographs
Loaned by Bureaus of the U. S. Government

BOSTON
LOTHROP, LEE & SHEPARD CO.

Published, August, 1915

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THE BOY WITH THE U. S. LIFE-SAVERS

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PREFACE

Upon the hungry rock-bound shores of Maine, and over the treacherous quicksands of Cape Hatteras, the billows of the Atlantic roll; the tropical storms of the Gulf of Mexico whip a high surf over the coral reefs of Florida; upon the Pacific coast, six thousand miles of sea fling all their fury on the land; yet no one fears. Serene in the knowledge that the United States Coast Guard and the Lighthouse Bureau never sleep, vessels from every corner of the world converge to the great seaports of America.

The towers that stand sentinel all day, or flame their unceasing vigilance all night, hold out their message of welcome or of warning to every ship that nears the coast, and not a point of danger is unprotected. Should an unreckoned-with disaster cast a vessel on the breakers, there is not a mile of beach that the Coast Guard does not watch.

Far in the northern Bering Sea, a Coast Guard cutter blazes the hidden trail through Polar ice for the oncoming fleet of whalers, and carries

American justice to where, as yet, no court has been; out in the mid-Atlantic, when the Greenland icebergs follow their silent path of ghostly menace, a Coast Guard cutter watches and warns the great ocean liners of their peril; and when, in spite of all that skill and watchfulness can do, the sea claims its toll of wreck, it is the Coast Guard cutter that is first upon the scene of rescue. To show the stern work done by the U. S. Coast Guard, to depict the indomitable men who overcome dangers greater than are known to any others who traffic on the sea, to point to the manly boyhood of America this arm of our country's national defense, whose history is one long record of splendid heroism, is the aim and purpose of

THE AUTHOR.

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THE BOY WITH THE U. S. LIFE-SAVERS

THE BOY WITH THE U. S. LIFE-SAVERS

CHAPTER I

A RESCUE BY MOONLIGHT

"HELP! Help!"

The cry rang out despairingly over the almost-deserted beach at Golden Gate Park.

Jumping up so suddenly that the checker-board went in one direction, the table in another, while the checkers rolled to every corner of the little volunteer life-saving station house, Eric Swift made a leap for the door. Quick as he was to reach the boat, he was none too soon, for the coxswain and two other men were tumbling over the gunwale at the same time.

Before the echoes of the cry had ceased, the boat was through the surf and was heading out to sea like an arrow shot from a Sioux war-bow.

Although this was the second summer that Eric had been with the Volunteers, it had never chanced to him before to be called out on a rescue at night.

The sensation was eerie in the extreme. The night was still, with a tang of approaching autumn in the air to set the nerves a-tingle. Straight in the golden path of moonlight the boat sped. The snap that comes from exerting every muscle to the full quickened the boy's eagerness and the tense excitement made everything seem unreal.

The coxswain, with an intuition which was his peculiar gift, steered an undeviating course. Some of the life-savers used to joke with him and declare that he could smell a drowning man a mile away, for his instinct was almost always right.

For once, Eric thought, the coxswain must have been at fault, for nothing was visible, when, after a burst of speed which seemed to last minutes—though in reality it was but seconds—the coxswain held up his hand. The men stopped rowing.

The boy had slipped off his shoes while still at his oar, working off first one shoe and then the other with his foot. It was so late in the evening that not a single man in the crew was in the regulation bathing-suit, all were more or less dressed. Eric's chum, a chap nicknamed the "Eel" because of his curious way of swimming, with one motion slipped off all his clothing and passed from his thwart to the bow of the boat.

A ripple showed on the surface of the water. Eric could not have told it from the roughness of a breaking wave, but before ever the outlines of a rising head were seen, the Eel sprang into the sea. Two of those long, sinuous strokes of his brought him almost within reach of the drowning man. Blindly the half-strangled sufferer threw up his arms, the action sending him under water again, a gurgled " Help ! " being heard by those in the boat as he went down.

The Eel dived.

Eric, who had followed his chum headforemost into the water hardly half a second later, swam around waiting for the other to come up. In three quarters of a minute the Eel rose to the surface with his living burden. Suddenly, with a twist, almost entirely unconscious, the drowning man grappled his rescuer. Eric knew that his chum was an adept at all the various ways of " breaking away " from these grips, a necessary part of the training of every life-saver, but he swam close up in case he might be able to help.

" Got him all right? " he asked.

" He's got me ! " grunted the Eel, disgustedly.

" P'raps I'd better give you a hand to break," suggested the boy, reaching over with the intention

of helping his friend, for the struggling swimmer had secured a tight grip around the Eel's neck. The life-saver, however, covering the nose and mouth of the half-drowned man with one hand, pulled him close with the other and punched him vigorously in the wind with his knee.

"Now he'll be good," said the Eel, grinning as well as he could with a mouth full of water. He spat out the brine, shook the water out of his eyes, and putting his hands on either side of the drowning man's head, started for the shore. Using a powerful "scissors" stroke, the Eel made quick time, though he seemed to be taking it in leisurely fashion. Eric, although a good swimmer, had all he could do to keep up.

"How do you think he is?" the lad asked.

"Oh, he'll come around all right," the Eel replied, "I don't believe he's swallowed such an awful lot of water. I guess he's been able to swim a bit."

The rescued man was a good weight and not fat, so that he floated deep. The sea was choppy, too, with a nasty little surf on the beach. But the Eel brought the sufferer in with the utmost ease.

As soon as they reached shore, Eric grabbed the

drowning man's feet while the Eel took him by the shoulders and lifted him on a stretcher which two other members of the Volunteer Corps had brought. As soon as the rescued man was placed on this, the bearers started at a quick pace for the life-saving station, and artificial respiration was begun.

In spite of the fact that the boy had seen dozens of half-drowned persons brought back to consciousness, the process never lost to him its half-terrible fascination. He always felt the lurking danger and he had been well-trained never to forget how much hung in the balance. Always it was a human life, flickering like a candle-flame in a gusty wind. Always the outcome was unknown.

Once Eric had worked for a solid hour over a man who had been brought in from the beach before he had been rewarded by any sign of life. The U. S. Volunteer Corps had drilled into him very thoroughly the knowledge that tireless patience and grim persistence will almost work miracles. Accordingly, when it came his turn, he joined readily in the work of restoration. The swim had tired him a little, and he was glad to quit when another member of the station took his place over the half-drowned man's body.

"Why do we use the Schaefer method, Doctor?" Eric asked.

"It's the best system for our work," was the reply, "because it can be done by one person. Quite often, a fellow may make a rescue and bring some one to shore, so that he will have to work alone. You're not going to be right at a station always."

"That's true," the boy said meditatively.

"Watch, now," continued the doctor, pointing to the life-saver, who was at work and who was kneeling astride the prone figure of the unconscious man. "You see Johnson's hands are pressing right between the short ribs, aren't they?"

"Yes, that's the base of the lungs, isn't it?" Eric queried.

"It is," the doctor answered. "Now when a man brings down the weight of the upper part of his body on his hands—the way Johnson is doing there—it means that about one hundred pounds of pressure is applied to those lungs, doesn't it?"

"Sure; fifty pounds on each lung," agreed the boy.

"You can see how that forces out nearly every bit of air in the lungs. Then, as soon as he leans

backwards again, and takes off the pressure, the air rushes in to fill the lungs. That makes artificial breathing, doesn't it? "

"Of course."

"That's the whole secret of restoration; that, and keeping everlastingly at it."

"But if the Schaefer method is the best way," protested Eric, "I don't see why everybody doesn't use it."

"Such as—"

"Well, the Life-Saving end of the Coast Guard doesn't!"

"I don't say the Schaefer is the only good method," answered the doctor; "nothing of the kind. It's the one that suits us best." He stepped over to the prostrate man, never relaxing his vigilant watch for the first sign of life. Then, returning to Eric, he continued, "The Coast Guard uses the Sylvester method, doesn't it? "

"One of the forms of it, Father told me," the boy answered. "He showed me how. It's quite different from what we do here."

"How did he show you? " asked the doctor interestedly; "there are so many different ways."

"Father told me to stand or kneel at the head of the chap who had been rescued, then, grabbing

hold of the arms above the elbows, to draw them up over the head, keep them there a couple of seconds, then force them down and press them against the sides of the chest. I suppose the principle is about the same."

"Exactly the same," the doctor said, "but of course every one has his preference. I like the Schaefer method best, myself, because in it the tongue hangs out and the water runs from the mouth naturally, while in the Sylvester method, the tongue has to be tied."

"But which is the better?" persisted Eric.

"There really doesn't seem to be much difference in the result," was the reply, "it's the man behind the gun, not the system. The Coast Guard so far holds the record for the most wonderful cases of recovery and theirs is the older method. The important thing is to know exactly what you're doing, and to do it with everlasting perseverance. Never give up! I've seen some wonderful examples of fellows just snatched back to life long after we thought they had gone. There was one, I remember—"

"Doctor!" called Johnson, "I think he's coming to!"

The rescued man gave a gasp and his eyelids flut-

tered. The doctor was beside him in an instant, but instead of seeming satisfied by his examination he shook his head doubtfully as he rose from the side of his patient.

"Going all right?" queried Eric.

"No," was the answer, "he's not. I think he's got smokers' heart. You'd better watch him a bit closely, boys! One can't ever tell in these cases."

"You mean he's not out of the woods yet, Doctor?" the lad asked.

"Not by a long shot," was the reply. "You can't play any monkey-shines with the heart. Judging by the shape that fellow's heart is in, I should be inclined to say he's been smoking for nearly ten years, smoking pretty heavily, too. And he can't be a day over twenty-three!"

"Do you suppose that had anything to do with his drowning?"

"Of course it had," the doctor answered. "Swimming is a real athletic exercise and you've got to keep in shape to swim well. What's more, you've got to have a decent heart to start with. But if a youngster piles into cigarettes, it's a safe bet that he's going to cripple himself for athletics in manhood."

"But you smoke, Doctor!"

"Sure I do," the other rejoined. "And I swim, pretty nearly as well as any of you young fellows. But I didn't start any cigarette business when I was a kid, the way lots of boys do now. It wasn't until I was in college that I smoked my first pipe."

"Then you think it's all right for a chap to smoke after he's grown up?"

"I wouldn't go as far as to say that," the doctor said, "but there's no doubt that the cases which have turned out worst are those in which the habit began early. Nature's a wise old scout, Eric, and you're apt to find that a man who's likely to be hurt by smoking won't develop a craving for it unless he started too young, or unless he forced himself to excess."

The boy wanted to question the doctor further, for he was thoroughly interested in finding out that smoking prevents an athletic manhood, when the speaker was interrupted by a cry from the half-conscious man.

"Jake!" he called.

The doctor was beside him in a second.

"What is it, son?" he said, bending his head down so that his grizzled mustache almost brushed the man's face.

Courtesy of U.S. Bureau of Lighthouses.

THE LIGHT THAT NEVER SLEEPS.

A powerful automatic beacon on Richardson's Rock, Cal., that burns half a year without attention.

"Jake! Where's Jake?"

A sudden silence swept over the station. Only the Eel moved. With that queer sliding step of his that was almost noiseless, he went to the door of the little house that faced the sea.

"Jake!" again the cry came. "Where's Jake?"

The man was relapsing into unconsciousness when the doctor quickly took a powerful restorative from his medicine-bag, which lay beside the cot, and held it to the man's nose. The fumes roused him.

"Where did you leave him?" queried the doctor.

"I—I couldn't get him," gasped the rescued man, breathing heavily.

There was a general rustle and every man half-turned to the door. In the silence a man's boot, being kicked off, clattered noisily on the floor.

"How do you mean you couldn't get him?" the doctor persisted. "Was he swimming with you?"

"He went down—sudden—" came the answer, weakly, "and when I tried . . . to help . . . he pulled at my legs."

The words were hardly out of his lips before the

station-house was empty save for the doctor and the rescued swimmer. As the door slid back behind them, Eric heard the man cry in a quavering voice,

"I've drowned him! I've drowned him! I had to kick him free to save myself!"

Outside, not a word was said. The men knew their work and their places. The coxswains were ready and the three white boats were sliding down the beach, the big boat down the runway, as the men heard that cry again,

"I've drowned him! I've drowned him. I had to kick him free to save myself!"

The words rang hauntingly in Eric's ears as his boat hit the first incoming billow. The former rescue in the moonlight had held a quick thrill, but it had been nothing like this tense eager race in the darkness. Nearly a quarter of an hour had passed in the station-house before the rescued man had recovered consciousness and the rescue had taken at least five minutes. Almost twenty-five minutes had elapsed, then, since the first cry of help had been heard.

The boats leapt forward like swift dogs released from leash. The oars were made to resist extreme strain, but they bent under the terrific

strokes of the life-savers. Over six thousand miles of sea the Pacific rolled in with slow surges, and out in the darkness, somewhere, was a drowning man, probably beyond help, but with just the faintest shred of possibility for life if he could be found immediately.

With that uncanny intuition which made him so marvelous in the work, the coxswain of Eric's boat steered a course fifty feet away from that of the larger boat.

Not a word was spoken until, above the swish of the water and the rattle of the rowlocks, the Eel said quietly,

"We picked him up a little to wind'ard of here!" Three men, among them Eric, slipped into the water. Almost at the same moment, five or six men plunged in from the other boats. The lieutenant stopped Eric's chum.

"You'd better stay aboard, Eel," he said; "you've already had quite a swim."

The Eel shrugged his shoulders disapprovingly, but, after all, orders were orders, and the captain of the Golden Gate station was a disciplinarian to his finger-tips.

In the broken gleams of the moonlight flickering on the tumbled water, the forms of the dozen

members of the corps could be seen. Ever and again one would disappear from sight for a deep dive to try to find the body.

This was a part of the work in which Eric was particularly good. He had a strong leg-stroke and was compactly built, although large-boned for his age. Tired though he was from swimming ashore with the Eel on the first rescue, he went down as often as any of his comrades. Looking back at the boat, he saw the Eel wave his hand in a direction a little south of where he had dived before.

Following out the suggestion, Eric took a long breath and went down. It was a deep dive, and he thought he saw a gleam of white below him. The boy tried to swim down a foot or two farther, but his breath failed him, and he shot up, gasping, to the surface. Not wanting to give a false alarm, yet knowing well that every second counted, the boy merely stayed long enough to get his breath, then, putting every ounce of power he possessed into a supreme effort, he went down again. This time he got a foot nearer, but not near enough to be quite sure. Again he darted up to the surface.

"Here, fellows!" he shouted.

The boat shot up beside him.

"Found him, Eric?"

"I think so, sir," the boy answered, "but he was too far down for me."

The Eel had stripped. He stood up and looked pleadingly at the lieutenant.

"Sure you're not tired?"

The Eel smiled.

"Overboard with you, then!"

He dived.

Dozens of times though Eric had seen the Eel dive, and often as he had tried to imitate him, the boy never ceased to envy his comrade his extraordinary power of going into the water without the slightest splash. Powerful dive though it was, scarcely a drop of water seemed to be displaced as the Eel went down.

During the few seconds that passed while these sentences were being interchanged, three or four others of the life-savers had rallied to Eric's call and were headed for the boat. One man, especially, a big, burly fellow who looked as though he would be too heavy to swim, but who possessed an astounding amount of endurance and who could hold his breath longer than any one else in the station, followed the Eel to the bottom. Eric was game, and although he was beginning to feel thor-

oughly done up, he joined the quest in the depths of the sea.

Moonlight gives no reflections beneath the water, and the sea was dark. The Eel was already out of sight below him, but as the boy made his way down, the powerful figure of the heavy swimmer came past him like a shadow.

A few seconds later, the Eel shot up by him, bringing an unconscious man in his grasp. The other swimmer followed. By the time Eric reached the boat he was exhausted and had to be helped in. The rescued man had been lifted into the large boat, and before the boy was even aboard, the other craft was half-way to the shore, racing like mad. The other boats followed.

As soon as the surf-boat touched the beach, the big man jumped out, two other members of the corps threw the unconscious figure across his shoulders for the "fireman's carry," and while the keel of the boat was still grinding on the beach, the rescued man was well on the way toward the house.

The doctor was waiting. The victim of the drowning accident, apparently dead, was put into hot blankets. His arms and legs were stiff. The

lips were quite blue and the whole of the face discolored. At the sight of him, and the little slimy ooze from his lips, the doctor looked grave. The big life-saver who had carried the sufferer in was already at work in an attempt at resuscitation.

A moment or two later, the first man who had been rescued and who was feeling a little stronger, turned over on the stretcher. He saw the swollen and discolored face of his friend and sent up a piercing cry,

"He's dead!"

Then, after a pause and a silence broken only by the rhythmic beat of the regular motions of the process of causing artificial respiration, came the cry again,

"I've drowned him! I've drowned him! I had to kick him free to save myself!"

Although the house was kept empty save for the four men, the doctor beckoned to one of the officers standing outside—so that there should be as much air as possible in the station—to come in and try to quiet the frenzied man.

"Bromides, Doctor?" queried the lieutenant, who had come in.

"Yes. Give him just one of the triple. No,

that won't hurt him," he continued in answer to a look; " it's excessive stimulation that a man with smokers' heart can't stand."

The life-saver gave the required dose and succeeded in soothing the poor fellow, who was still terribly weak. The men sat on the steps outside, talking in low tones. Every one of them was keenly conscious of the strain. For twenty minutes there was no sound from within the station except the hard breathing of the man who was putting in all his strength to give the recumbent figure the motions of respiration.

" Ryan! " the doctor called suddenly.

A strapping young fellow jumped up like a shot and darted into the station to take the place of the exhausted worker. Wiping his forehead and breathing hard, the latter came out to his companions.

" Do you think there's any change, Jim? " one of them asked.

" Not so far as I can see," the other answered, shaking his head.

" How long do you suppose he was under? " queried another.

Close comparison of watches gave the actual time as between nineteen and twenty-one minutes.

"Has any one ever been saved who has been under water as long as that?" asked Eric.

"Eighteen minutes is the longest I've ever seen," answered Johnson, the veteran of the corps, "but, of course, there's the Mooney case."

The boy listened a moment, but no sound came from the station. It was less nerve-racking to talk than to listen, so he went on,

"What was the Mooney case?"

"That was a Coast Guard job, in the days when the United States Life-Saving Service was a separate bureau. It was quite a queer case in a good many ways."

"How long was Mooney under water? Half an hour, wasn't it?" questioned another of the men.

"Thirty-one minutes, according to general reports," Johnson replied, "but to make sure that they weren't stretching it, the official report made it 'twenty minutes or over.' One of my pals worked on the man."

"How was it?" queried Eric. "In a storm?"

"Beautiful sunny Fourth of July," was the reply. "And, what's more, it was in shallow water, near shore, and the man could swim!"

"But how in the world—"

"That's exactly what I'm telling," Johnson

continued, resenting the interruption. "It was during a boat race on Point Judith Pond in Rhode Island. My pal, who was a surfman, had been assigned to duty there. Naturally, he was watching the races. On the other side of the pond a small flat-bottomed skiff, carrying one sail, capsized. There were three men in her. Streeter, that's the fellow I know, saw the boat capsize, but he knew that the water was shallow and noted that it was near shore. Just the same, he kept an eye on the boat. As soon as he saw two men clinging to the sides of the skiff, he started for the scene of the accident. He was about a third of a mile away.

"What had happened was this. When the boat capsized, the swinging boom struck Mooney on the head, making him unconscious. He was swept under the sail and pinned down by it. The other two men, neither of whom could swim, managed to scramble on to the capsized skiff. They saw no sign of Mooney, and knowing that he was a swimmer, thought he had struck out for the shore. It wasn't until several minutes later that it occurred to one of them that their comrade might be pinned under the sail.

"With a good deal of personal risk, for his hold was insecure and he couldn't swim, this chap man-

Courtesy of Outing Magazine.

THE LONELY WATCHER OF THE COAST.

Courtesy of Outing Magazine.

WHERE PATROLS MEET. THE HALF-WAY POINT.

aged to get hold of the canvas and somehow—he said he didn't know how, himself—succeeded in getting Mooney out from under the sail. He gripped Mooney's collar, but could not lift his head above water. All that he could do was barely to hold on."

"Showed a good deal of grit to do even that, it seems to me," said one of the life-savers. "It's an awful feeling to be nearly drowned."

"It did show grit," agreed Johnson. "If it had been a drowning woman with long hair, she could have been held up all right; but a grip on the collar, when the head is hanging forward, means a dead lift out of water. I don't wonder that the young fellow wasn't able to do it.

"When my pal reached there, he got Mooney aboard, the other two clambered in and they started for the shore. Mooney was as purple as a grape and his arms were so stiff that two men, one on each side, could barely move them. Nearly a quart of water was got out of him, and they had an awful job prying open his jaws.

"They worked over him for an hour and twenty minutes before there was the slightest sign of life. Not until twenty-five minutes more did the heart begin, and Mooney did not regain consciousness

until nine hours later. As his watch had stopped at 4:20 P.M. and it was 4:53 when Streeter got ashore, that man's heart had stopped, his breathing had stopped and he had been practically dead for more than two hours."

"Just goes to show," said one of the others, "that it isn't merely swallowing water that drowns a fellow."

"It isn't swallowing water at all, as I understand," rejoined another member of the group. "Drowning's a kind of poisoning of the blood because the lungs can't get oxygen. It's just like choking to death or being hanged."

There was a call from within.

"Murchison!"

The life-saver who had just been speaking, got up quickly and went in to relieve Ryan.

"Any luck?" Johnson asked, as the latter came out.

The Irishman shook his head.

"There's nothin' yet, but he moight come round anny minute," was his reply, with the invincible optimism of his race.

Eric had been thinking of Murchison's description of drowning.

"Why did they roll half-drowned people on a barrel in the old times?" he asked.

"Sure, they were ijits," Ryan answered cheerfully.

"But what was the idea? To get the water out?"

"Just that. They used to think the lungs were a tank."

"Murchison was saying that people drowned because they couldn't get oxygen. Isn't there oxygen in water?"

"Av coorse there is," the Irishman replied. "But ye've got to have the gills of a fish to use it. Annyhow, a man's got warm blood an' a fish has cold. It takes a lot of oxygen to get a man's blood warm. An' if he doesn't get it, he dies.

"Ye see, Eric," he continued, "that's why ye've got to go on workin' over a drowned man. Ye can't tell how badly he's poisoned. An' it's honest I am in tellin' ye that I think we've got a chance in there."

"You do?"

"I do that," was the cheery answer. "There's no tellin'."

Again came that cry from the station, a cry

whose very repetition made it all the more nerve-racking,

"I've drowned him! I've drowned him! I had to kick him free to save myself!"

Eric shivered. There was something gruesome in the monotony of the same words over and over again. The noises on the beach died down. Several of the men, who did not live at the station-house, went to their cottages. The boy gave a jump when he heard a step behind him and saw the old doctor standing there.

The night was very still. Nothing could be heard but the roar of the surf on the beach. Eric, who was imaginative, thought that the surf seemed to be triumphing in having snatched another life. Feeling sure that the doctor would understand him, the boy turned and said,

"Doctor, shall we be able to beat out the sea?"

The Highland imagination of the doctor instantly caught the lad's meaning.

"You've heard it, too!" he said. "Many and many's the time I've thought the sea was skreeling in triumph when a drowned man was brought ashore. But I've snatched a many back."

"Will you—" began the boy.

"Doctor!" came a cry from within.

"Well?" he answered eagerly, stepping to the door.

"I thought I caught a breath!"

The doctor's keen eyes glinted as he knelt beside the prostrate figure.

Nine, ten, eleven times the weight of the life-saver was brought forward and released. At the twelfth, there was a slight respiration.

"Did you see, Doctor?" he cried, pausing in his work.

"What the mischief are you stopping for?" was the doctor's impatient answer. Then he added, "You're doing splendidly, Murchison; just keep it up!"

Five more minutes passed without a single sign. Both men had begun to feel that possibly they had been mistaken, when there was a definite flutter of an eyelid. The surfman would have given a triumphant shout but for the doctor's rebuke a moment or two before.

Quietly the old Scotchman began to promote circulation by rubbing the legs upward, so as to drive the venous blood to the heart and thus try to start its action. Almost ten minutes elapsed before the doctor's patience was rewarded with the faint throb of a heart-beat, then another. It was soft

and irregular at first, but gradually the blood began to move through the arteries and in a few minutes a pulse could be felt. The lips lost a little of their blue color and breathing began.

"He's got a grand heart!" said the old doctor, ten minutes later, as the pulse-beats began to come with regularity. "I hardly believed that we could bring him round. It's a good thing it was this chap and not the other. We could never have saved yon man if he had been half as long submerged."

"You really think that we shall save him?" queried Eric, more to hear the doctor's assurance than because of any doubt of the result.

"We have saved him," was the reply. "In a day or two he'll be as well as he ever was. And, to my thinking, he'll be wiser than he was before, for he'll never do such a silly thing as to go out for a swim at night-time after dinner with—well, after a heavy dinner."

"Seems too bad that we can't tell his friend," the boy suggested. "It's just awful to hear him accusing himself all through the night."

"If he's asleep," the doctor answered, "that's better for him than anything else. Oh, I don't

know," he continued, "he seems to be stirring. Do you want to tell him?"

Eric flashed a grateful glance at the doctor.

"If I might?"

"Go ahead!"

"Mr. Willett," said the boy, coming close to the stretcher. "Mr. Willett!"

"Well?" said the rescued man, waking out of a remorse-haunted dream.

"Jake has been saved. He's all right."

In spite of his exhaustion and his sudden awakening from sleep, the first man who had been rescued sat up on the stretcher and craned his head forward to see his friend. In spite of the sufferer's bruised and swollen appearance, it was evident to the most inexperienced eye that life was not extinct. The convalescent looked at the doctor and tried to find words, but something in his throat choked him.

He reached out and grasped the boy's hand, holding it tightly. Then, looking around the station, he said softly,

"A man's world is a good world to live in!"

CHAPTER II

THE LIGHTS THAT NEVER SLEEP

It was a happy awakening in the life-saving station the next morning, for both the rescued men were well on the road to recovery. Eric had intended to be the first to tell Willett the entire story, but the events of the night had been a heavy strain on him and he had slept late. Indeed, he did not waken until the gang of boys came round for their morning drill. Drill was scheduled at nine o'clock, but it was seldom that there failed to be at least half a dozen urchins around the station by eight, or even earlier.

"What's all this drill the kids are talking about?" Willett asked Eric, as the boy came back from breakfast. "To hear the way they go on, you'd think it was the only important thing that had been scheduled since the world began!"

"That's the Commodore's doing," replied Eric, with a laugh. "He's got us all going that way. You know Hailer is one of those chaps who believes

so much in what he's doing that everybody else has to believe in it, too."

"But I thought Hailer was commodore in New York, not out here in 'Frisco."

"So he is," agreed the boy. "But a mere trifle like a few thousand miles doesn't seem to weaken his influence much. Of course the biggest part of his time is given to superintending the New York end, but the work's spreading in every direction and all our reports go to headquarters. After all, organization does make a heap of difference, don't you think? How about it? Are you fit enough to come and see the youngsters at their work?"

"I'm a bit wobbly," the rescued man answered. "I suppose I ought to expect that. But I feel all right. I can get as far as that bench, anyway, and I'd like to see the drill. You teach them all to swim?"

"We try to teach everybody we can get hold of," replied Eric. "Hailer has an idea that every man, woman, and child in the United States ought to be able to swim, even when asleep. I've heard him say that it was as much a part of our job to prevent accidents as to do the best we can after accidents have happened. I think he's about right. Everybody ought to swim, just the same way as

they know how to walk. Then we wouldn't have to fetch out of the water a lot of people who are already half-drowned."

"You do that in great shape, too," said Willett gratefully, "I can testify to that! I was a goner last night, sure, if you fellows hadn't been there. And the way you brought Jake around—I wouldn't have thought it possible."

"We were mighty lucky," agreed the boy.

"You were!" exclaimed Willett. "I think we're the lucky ones."

"I suppose you are," said Eric. "But, after all, if both your chum and you had been A No. 1 swimmers, just see how easy it would have been! You could have got ashore in a few minutes. That's what we want to do with the kids. We want to teach them to swim so that if they tumble off a dock with their duds on they can strike out for shore like so many frogs. We manage to break in nearly every youngster who comes down to this beach. Most of them want to get the hang of it, anyway, and when there's a bunch of youngsters to start with, it's a cinch to get the rest to join in."

"But still I don't see how you can teach them on land," Willett objected.

"Why not?"

"You're supposed to swim with your legs as well as your hands, aren't you?"

"Of course. It's the legs that you really do the swimming with."

"That's what I thought. But how can you kick out with both legs when you're standing on them?"

"Oh, that's what's troubling you," said Eric laughing. "But there's nothing difficult in that. The idea in the leg motions of swimming is to bring the legs to the body, isn't it?"

"That's what I always thought."

"It doesn't make any difference if you bring the body to the legs, does it?"

"I—suppose not," the other said, dubiously.

"Of course it doesn't. That's just the idea. You watch the kids going through the drill and you'll get on to it. Why, I can put a bunch wise to swimming, though they're a thousand miles away from any water deep enough to drown in."

Eric had hardly got outside the station when the boys flocked to him in a body. He answered their fusillade of greetings with equal heartiness and then called them to attention.

"Get to business, now!" he called, and the group lined up in fours, each boy about six feet

from his neighbor. "Ready!" he called. "One! Hands together, palms to each other. Swing 'em around a little behind the level of the shoulders turning 'em palm outward as you go. This way!" He showed the motion. "At the word 'Two'—bring the hands in to the breast. At 'Three' put the hands forward. All together, now: One! Two! Three!"

The boys followed the motions, some doing it well, but others looking very clumsy and awkward. A dozen times or more the boys went through the drill until a certain amount of regularity began to appear.

"Leg motions next," Eric called briskly. "At the word 'One!' bring the body down to the heels in a sitting position. At the word 'Two' straighten up and jump with both legs wide apart. At the word 'Three,' jump and bring the legs close together. That's the one that shoots you ahead."

This was repeated a dozen or more times and then Eric started the youngsters doing both the arm and leg motions together. It was really hard work, but when he let the urchins go at the end of about half an hour, some of them could do it like clockwork.

Courtesy of U.S. Volunteer Life-Saving Corps.

BREAKING A DEATH-CLUTCH FROM BEHIND.

Courtesy of U.S. Volunteer Life-Saving Corps.

BREAKING A DEATH-CLUTCH FROM THE FRONT.

Teaching life-saving at its best, the Commodore [the tallest man in uniform] watching.

"How much real swimming do you suppose the kids learn from that stuff?" Willett asked.

"About one-third of them can swim right away," Eric answered. "It's mostly in getting used to it. After all, if a kid gets hold of the right stroke and practises enough so that he can do it automatically, he can't do anything else but that when he gets into the water. The more scared he is, the surer he is to do the thing he's got used to doing. What sends people down in the water, is that they've got a wrong idea. They wave their arms about, and as soon as your arms are out of the water, it just alters the balance enough to put your mouth under."

"Seems to me I might learn something from that myself—" Willett was beginning, when a long-continued whistle blast sounded from the station. Eric was off like a shot. Quick as he was, however, he was only just in time to scramble into the first boat.

"What is it?" the boy asked.

"Motor-boat on fire," answered the coxswain, "an explosion, most likely. I guess the boat's done for, but the Eel saw the trouble the minute it happened, so we oughtn't to have any trouble

picking the people up. He said there were girls, though, and probably they can't swim."

As the life-saving boat cut through the water, it passed three or four swimmers who had started out from the beach on seeing the accident. There was a great deal of excitement on shore, as, being a fine Sunday morning, the beach was crowded.

"We'll be with you in a minute," shouted one of the intending rescuers as the boat swept by.

As usual, the Eel was the first man overboard, and his queer snake-like stroke showed to full effect. There had been five people in the boat, three men and two girls, one of them just a child. One of the men and one of the women couldn't swim a stroke. The woman had already given up and the Eel took care of her. Another of the life-savers tackled the struggling man.

It was evident that there was no need for more help there, so Eric swam to where the little girl was striking out bravely for the shore.

"Can I give you a hand?" he asked.

The child, though swimming pluckily, evidently was hampered by being fully dressed.

"Can't swim a bit with my boots on," she gurgled. The boy smiled with genuine appreciation of her grit.

"You're the real thing," he said. "But it is hard swimming with boots on. Suppose you let me take you to shore. It's just as easy!"

He swam in front of the child.

"Put your hands on my shoulders," he said, "and keep your feet well up. Are you all right now?"

"Quite all right," she answered, dashing the water out of her eyes.

"I see they've put the fire out," said Eric, swimming quietly and easily, for the girl's touch was like a feather on his shoulder. "I don't believe the boat's much hurt."

"I'd be awfully glad if it wasn't," she answered, "because Jack just borrowed it for the day and I'm sure he's feeling terribly. We were just going to buy one this week."

"Perhaps this will scare him off."

In spite of her fatigue and fright the girl laughed brightly as Eric's feet touched bottom and he stood up.

"It might him, but it won't me," she said, with a joyous disregard of grammar. "And Jack's buying the boat mainly for me. I really can swim quite well, but I suppose the explosion scared me. I don't believe I'd have been frightened a bit if I

had jumped in of my own accord. But it was all so sudden!"

"Well," said Eric, "it's a good thing for you it didn't happen a long way from shore. And I'm glad I was able to help a bit, too, because this is my last day on duty and having helped you is about the best way of celebrating it that could have happened."

"Your last day?" she said, with a note of regret in her voice. "You're going away?"

"Yes," Eric replied, as they came to the water's edge and the crowd began to congregate to meet them, "I'm just getting ready to join the Coast Guard!"

"Great!" she exclaimed, her eyes sparkling, as she shook back her wet hair. "But how can I thank you?"

"You have thanked me," the boy answered, as he took her to the beach where the lifeboat had landed and where her friends were anxiously awaiting her, "you've given me a chance to quit in a sort of 'blaze of glory.' Don't you think that's something?"

"But won't you tell me who you are?" she pleaded.

"United States Volunteer Life-Saving Corps,"

he answered with a smile, as he turned to go back to the station, "that's where the credit ought to go."

"So this is your last day, Eric," said the Eel, an hour or so later, as the boy stood on the platform of the life-saving station, looking regretfully at the strip of beach.

"Yes, Eel," Eric rejoined thoughtfully. "I hate to leave here, too."

"I always hate to go, of course," his chum agreed, "but then it's different with me. This is my vacation. When I quit here, it means that I've got to get back to work. You're only going back to school."

"Not my fault," was the half-rueful answer; "I'd a heap sooner be going into the Coast Guard right away. But I'm not ready yet."

"You will be, next year," said his friend, sympathetically.

"I know. But next year's a long way off and I wanted to stay here until I was sure of my appointment. If Father were only going to stay another year on the coast, I could finish my work here and then get ready for the exams in June."

"Is he leaving?"

"Of course. Don't you remember I told you before!"

"Yes, so you did. I'd forgotten."

"We're hiking off at the end of this month. Father's been put in charge of one of the districts on the Great Lakes."

"But I thought he was inspector here?"

"He's been acting-inspector for quite a while. But that was a temporary appointment, while the inspector was ill."

"And you're going home a couple of weeks ahead to help pack, eh?"

"Ye-es," Eric answered, "of course that's a part of it. But I'm going now because I want to see Uncle Eli before I go East. He's on Tillamook Rock, you know."

"I knew he used to be," the Eel said, "but I thought when he made that big real estate haul, he quit."

"He tried to," the boy agreed, "but he found he couldn't. Uncle Eli's an old-timer, Eel. I used to be jealous of the Tillamook Light. He's just as fond of it as he is of me, more, I think. I can quite see how he would feel that way. It's always been just like his child. He was there when the light was born."

"You mean its designing?"

"I mean its being born," Eric insisted. "Nearly all my people have been in the Lighthouse Service, you know. They all have that way of thinking of the lights as if they were real folks. It's something like a captain's idea about his ship. She's always alive. And lights are just as responsive. Some way, I've a bit of that same feeling myself."

"Yes," the Eel said thoughtfully, "I can see that, in a way. They do seem a bit human, don't they? And it must be deadly lonely for the keepers, out of reach of everybody, with nothing to do."

"What?" shouted Eric, so loudly that the Eel jumped. "With nothing to do?"

"Except just attend to the light," his chum said apologetically. "What else is there?"

"I suppose you think they just light the lantern when they have a mind to and then snore all night long?"

"N-no, of course they can't," the Eel replied, humbly, "I hadn't thought of that. I suppose they have to keep watch."

"You bet they do," Eric said emphatically, "and a mighty close watch at that. And when it

comes to discipline—the Lighthouse Service has every civilian organization in America beaten to a frazzle."

"I didn't know it was so strict."

"Strict! Carelessness means dishonorable dismissal, right off the bat! Not that there's ever much chance of such a thing ever being needed. The Commissioner has built up such a sense of pride in the service that a chap would do anything rather than neglect his duty. I'll tell you a story of a woman light-keeper, a woman, mind you, Eel, that'll show you. You know Angel Island?"

"Right here in San Francisco Bay?"

"That's the one. You know that there's a light and a fog signal there?"

"I hadn't ever thought of it," the other replied. "Yes, I guess there is."

"There's a new fog-horn on that point now, Eel, but when I was quite a small shaver, in 1906, the fog signal was a bell, rung with a clapper. In July of that year the clapper broke and couldn't be used. A heavy fog came down and blanketed the island so that you couldn't see anything a foot away. That woman light-keeper stood there with a watch in one hand and a nail-hammer in the other and struck that bell once every twenty seconds for

twenty hours and thirty-five minutes until the fog lifted. She didn't stop for meals or sleep. Two days later, the bell not having yet been fixed, another fog came down at night and she did the same thing the whole night long. That's what I call being on the job!"

"Yes," the Eel agreed with admiration, "you can't beat that, anywhere."

"And you spoke of light-keepers being idle!" continued Eric, warming to his subject. "Keeping a lighthouse in the shape that the Commissioner insists on isn't any easy chore. I tell you, the operating room of a hospital isn't any cleaner than the inside of a lighthouse. They tell a story in the service of a hot one that was handed to a light-keeper by one of the inspectors. The keeper hadn't shaved that morning. The instant the inspector saw him, he said:

"'If the lamp doesn't look better kept than you do, you're fired!'"

"That's swift enough!" the older boy answered, with a whistle.

"Nothing saved that light-keeper but the fact that everything else about the place was in apple-pie order. I've heard Father tell how some of the inspectors go around with a white handkerchief,

and if they find any dust—there's trouble for somebody!"

"Don't you think that's carrying it a bit too far?" queried his chum.

"I used to think so," Eric said, "but I don't now. I've got the idea that's behind the rule. Everybody isn't cut out to be a light-keeper. The work calls for just one thing, a tremendous conscientiousness. There's no one to keep constant tab on men in isolated stations. Men who haven't got the right point of view won't stay in the service, and those who have got it, get it developed a lot more. The way it looks to me, the Commissioner has built up an organization of men who do their work because they believe in it, and who naturally have a liking for regularity and order."

"You're sure stuck on the Lighthouse Service, Eric," said his chum with a laugh.

"Why wouldn't I be?" the lad replied. "If all my folks are in it, I've probably got some of that same sort of feeling in my blood. But I'm different, too. The same thing to do over and over again, day after day, month after month, would get my goat. I want to do something that's got more variety and more opportunity. That's why

Courtesy of U.S. Bureau of Lighthouses.

THE "EDDYSTONE" OF AMERICA.

Minot's Ledge Light, off Boston, one of the most important lighthouses on the American coast, a triumph of engineering.

I'm going to join the Coast Guard—if I can get in."

"Well," the Eel said, sighing, "I envy you. So far as I can see, I'm like your lighthouse-keeper. I'm stuck at a desk for the rest of my life. You go ahead, Eric, and do the big stuff in rescue work, with uniform and epaulets and all the rest of it. I'll stay right on my job in the city and—on Saturdays, Sundays, and vacations—I'll do my little best in the volunteer job on this beach."

"It's bully work here, all right," agreed Eric, "and I'm only sorry I can't be in two places at once. Good luck, old man," he continued, shaking hands with his chum heartily, "I'll drop you a line written right on Tillamook Rock, and maybe it'll have the real sea flavor to it!"

Eric was quite excited in joining his father at Astoria, where they were to take the lighthouse-tender *Manzanita* to Tillamook Rock. During all the years his father had been connected with the light, both as light-keeper and as inspector, he had never taken his wife or son there. Of course, under no circumstances would they have been allowed to stay over night, but Eric had never even visited the rock. The boy had begged for a chance

to stay over one night, just to stand one watch in the lighthouse, but—rules were rules. The utmost privilege he could get was permission to go to the lighthouse with his father, when the latter was making his final inspection before transfer to another district.

"I hear you've been distinguishing yourself, Eric," the veteran said, when the *Manzanita* had cast off from the wharf.

"How do you mean, Father?"

"Rescues, and that sort of thing. It made me feel quite proud of my son."

"There were a few," the lad answered, with a quick flush of pride at his father's praise, "but at that I don't think I got my full share. We had a fellow there we called the 'Eel.' Nobody else had a chance to get anything when he was around."

"Good swimmer, eh?"

"He was a wonder! Why, Father, he used to swim under water nearly all the time, just putting his nose out to breathe once in a while, and at the end of his side stroke he had a little wiggle that shot him ahead like greased lightning. Funniest stroke you ever saw!"

"Couldn't you pick it up?"

"Oh, I got the stroke all right," Eric answered

confidently, "but I can't do it the way he did. And you should have seen him dive!"

"I always was glad you took kindly to that work," said the inspector thoughtfully, "because I believe it is pretty well handled, now that it's on an official basis. It certainly supplements the government's life-saving work very well. I've wondered, sometimes, whether it oughtn't to be taken hold of by the nation."

"I don't think it's necessary, Father," Eric replied. "You see, if it was a government station, the regular crew would have to be on duty all the time. There's no need for that. There aren't any accidents there, except when the beach is crowded, and that's just for Saturdays and Sundays, mainly, and a couple of months in the summer."

"That may all be true, but when an accident does occur, experts are needed in a hurry. Amateur work doesn't amount to much as a rule."

"This isn't amateur!" protested the boy. "Why, Father, do you know what a chap has to do before he can even enlist?"

"No," the other replied. "I never heard the requirements, or if I did, I've forgotten them. What are they?"

" A fellow who applies has got to show that he can swim at least a hundred yards in good style, and twenty yards of that must be in coat, trousers, and shoes. He's got to be able to dive and bring up something from the bottom, at a depth of ten feet. He's got to swim twenty yards carrying a person his own weight and show that he knows three different ways of carrying a drowning person in deep water. He's got to show that he can do at least three of the ways to ' break ' death-grips made by a drowning person. And besides that, he's got to know all about first aid, especially resuscitation."

" You mean that an applicant has to pass that test before entering the volunteers at all? "

" He sure has, and he's got to show that he can do it easily, too! "

" That's good and stiff," said the old inspector. " You can do all that, Eric, eh? "

The boy smiled.

" I've got a Proficiency Medal, Father," he said, not a little proudly.

" What's that for? "

" That's the test to show you're really A 1. To get that medal you've got to swim under water for over thirty-five feet, you've got to know all the

' breaks,' and you've got to show a ' break ' to be made by a third party if you're rescuing a rescuer who has got into the clutch of a drowning man in any way that he can't shake loose. Besides that, you've got to swim back-stroke sixty feet with the hands clear out of water, and sixty feet side, using one arm only. Then, just to show that it isn't exhibition stuff but the real goods in training for life-saving, you're made to swim sixty feet fully dressed and back forty feet, on the return carrying a man your own weight; dropping him, you have to start right off for another sixty feet out and forty feet back, this time carrying the man back by a different method."

" It's real swimming! " exclaimed the veteran of the sea.

" You bet," said Eric, " and I'm not nearly through. There's another sixty-foot swim, and at the end of it you've got to dive at least twelve feet and bring up from the bottom a dead weight of not less than ten pounds and swim ten feet carrying that weight. I tell you, Father, that's quite a stunt! And then, besides all the swimming stuff, you've got to show that you're Johnny-on-the-spot in throwing a life-buoy, to say nothing of a barrel of tests in first aid, and in splicing and knot-tying

of nearly every sort and shape. You don't get any chance to rest, either. All that swimming business has to be done on the same day. It's a good test of endurance, all right."

"And you passed it, son?"

"I got ninety per cent.," Eric answered. "I thought I'd told you all about it. No, I guess it came off when you were on one of your trips. I don't go much on boasting, Father, but I really can swim."

"Well, my boy," the other said, "I'll take a little credit for that. Don't forget I was your first swimming teacher! But I couldn't do all those things you've been telling me about, now. I'm glad to know they've got as high a standard as that in the Volunteer Corps. I shouldn't wonder if the Coast Guard would be able to get some of its best men from the volunteer ranks. Take yourself, for example."

"It's done me a lot of good," said the boy.

"Of course it has. It would do anybody good. But I've been wanting to ask you, Eric, what effect the formation of this new Coast Guard will have on your plans?"

"It won't hurt them a bit," the boy answered. "I wrote to the Captain Commandant about it

and he sent me the dandiest letter! I'll show it to you when my trunk gets home. You see, Father, when the Life-Saving Service and the Revenue Cutter Service joined together under the name of the Coast Guard, it was arranged that every member of both services might reënlist without examination. And my application was in last year. So that there's nothing special, I'm just going through the regular order of things. That is, if I can make the Coast Guard Academy."

"You ought to manage it, I think," said his father. "I'm really glad you have made up your mind to it, Eric," he continued; "it's a good full-size man's job. And you have quite a bit of the salt in your veins, my lad, for, after all, most of your kin are seafaring folk."

"You never had anything to do with the old Revenue Cutter Service, had you, Father?"

"I was never a member of it," the other replied, "but I've seen it at work, many times these forty years. No, I got into the Lighthouse Service when I was about your age and I've given every bit of myself to it ever since. I'm glad I did. I think the last fifty years has shown the greatest development of safety at sea since the days of the discovery of the compass."

"Yet you didn't want me to join!"

"Not now," the old inspector answered. "Conditions have changed. The Lighthouse Service of to-day is a complete and perfected organization. Every mile of United States territory is covered by a beacon light. We were pioneers."

"I see," said the boy thoughtfully.

"It's a good deal the same sort of development that's struck the cattle country," the Westerner said, meditatively. "When I was a youngster, a cattle-puncher was really the wild and woolly broncho-buster that you read about in books. In the days of the old Jones and Plummer trail, when there wasn't a foot of barbed wire west of the Mississippi, a cowboy's life was adventurous enough. A round-up gang might meet a bunch of hostile Indians 'most any time, and a man had to ride hard and shoot straight. But now the ranges are all divided up and fenced in. The range-runner has given way to the stock-raiser. It's like comparing Dan'l Boone to a commercial traveler!"

"I don't quite see how that fits the Lighthouse Service," said Eric, smiling at the Daniel Boone comparison.

"Well, it does to a certain extent. When I first went into the Service, half the coast wasn't protected at all. And even the important lights we had were weak, compared with what we have now. Why, Eric, we've got lights so powerful now that we can't even tell how strong they are!"

The boy looked up incredulously.

"It's an absolute fact," the old inspector continued. "The most powerful light we have is on Navesink Highlands, near the entrance of New York Harbor. It's reckoned at between two million and ten million candle-power. Nobody's been able to measure it. The United States Bureau of Standards was going to do it, but so far, they've left it severely alone."

"How far can that be seen, Father?"

"All depends on the height of the ship's deck from the water," was the reply. "The curvature of the earth determines that. Say, thirty miles on a vessel of moderate size. But the reflection of the Navesink Light on the sky has been seen as far away as eighty miles."

"White light?"

"Yes, white flashing," was the reply.

"I've noticed," the boy said thoughtfully,

" that red is only used for the smaller lights. I wanted to ask you about that the other day. Now there's Point Adams Light," he continued, pointing off the starboard bow as the lighthouse-tender steamed out of the mouth of the Columbia River, " it looks just as big as this light on the other side, on Cape Disappointment, but it's a lot harder to see. When I've been headed for home, on a misty night, after a day's fishing, I've missed Point Adams when Cape Disappointment was as clear as could be."

" But you could see other lights? "

" Oh, yes, there wasn't any difficulty in making the harbor, either in or out. I was just wondering whether the color of the light had anything to do with making it seem dim? "

" Of course," his father answered; " a red glass cuts off sixty per cent. of the light. You can't see the Point Adams Light for more than about eleven miles, but, in ordinarily clear weather, you can see the fixed white light of Cape Disappointment for all of twenty-two nautical miles."

" I don't quite see why," said the boy, puzzled.

" That's because you're not taking the trouble to think," was the impatient reply. " You know

that light is made up of all the colors of the rainbow? ''

'' Of course.''

'' And red is only a small part of that, isn't it? ''

'' Yes.''

'' Well, don't you see? Red glass only lets the red rays through and cuts off all the rest. How could it help being a lot fainter? And, what's more, red doesn't excite the nerves of the eye as much as white does, so that if there were two lights of equal power, one red and one white, the red would be less easily seen.''

'' Why do the railroads use red for danger signals, then? ''

'' Habit, mainly. It's wrong, of course, and a good many of the railroads are changing their danger signals from red to yellow. So far as we're concerned in the Lighthouse Service, however, we're getting rid of all the fixed red lights wherever a long-range warning is needed.''

'' How do you distinguish the different lights, then? ''

'' Using flashing lights, with flashes of different duration.''

'' Why didn't you always do that? '' asked Eric.

'' Didn't know enough,'' was the simple reply.

"It's only lately that we've found out how to work a flashing light without any loss of power. In the old days we used to depend on occulting lights, but now, flashing lights are much more powerful. You know the difference?"

"Sure! An occulting light means that some of the time the light is shut off, and at others it isn't. Wasn't it worked by a revolving shutter with wide slits in it?"

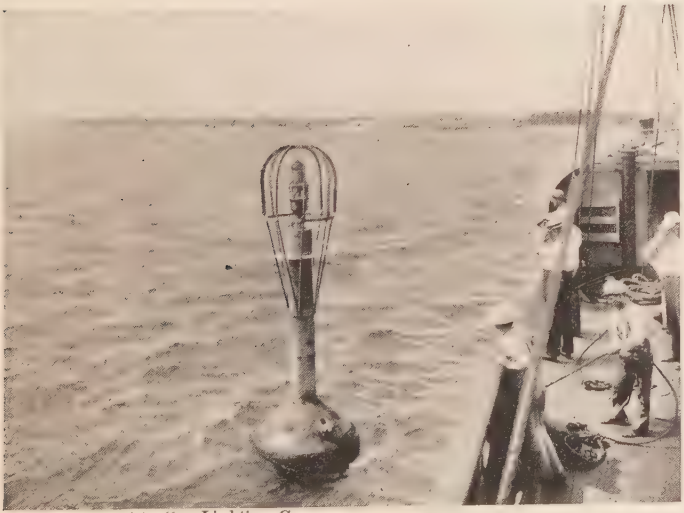
"That was the old idea. We use it still as a cheap way of changing a fixed light to one with a definite character. It works all right, only it's a waste of power to have the light darkened part of the time. Then, too, if the shutter revolves too quickly, the light is like little flashes of lightning, while, if it goes too slowly, a lookout might happen to scan that point on the horizon at the instant it was dark. In that way the value of the warning would be lessened."

"I know the flashing light is quite different, Father, but just how is it worked?" asked the boy. "It's because of some arrangement of the lens, isn't it?"

"Exactly. Light travels in straight lines in every direction. One of the problems of illumination in lighthouse work is to make all these beams

Courtesy of Safety Car Lighting Co.

REFILLING PINTSCH GAS BUOY.



Courtesy of Safety Car Lighting Co.

LIGHTHOUSE TENDER APPROACHING BUOY.

come to one focus. We don't want to light the sky, nor the sea at the foot of the lighthouse. So a first-order light is built up of rows on rows of prisms so arranged that the light will be refracted from every direction to one point. An ordinary student's reading lamp, inside a big lighthouse lens, would give a light that could be seen a good many miles!"

"That is, if it were high enough up."

"Of course."

"Just how quickly does the earth's curve come into play, Father? I know the earth is round, of course, but, somehow, it seems so big that one never thinks of taking it into any practical account."

"It works mighty rapidly, my boy," said the old inspector. "You put a light right at sea level, on a day when there isn't a ripple on the sea, and five miles away, at sea level, you won't see a sign of it! Fifteen feet is the unit. Fifteen feet above sea level, you can see a light fifteen feet above sea level, seven miles away."

"Then why not build lighthouses like the Eiffel Tower, a thousand feet high!"

"Once in a while, Eric," his father said, rebukingly, "you talk absolutely without thinking.

Didn't I just show you that the rays of a lantern had to be sent out in a single beam? "

"Yes, but what of that? "

"Can't you see that if your light is too high, the beam will have to strike the water at such an angle that its horizontal effect would be lost? That would mean that a ship could see the light seventy miles away, and lose it at fifty or forty miles from the lighthouse. No, boy, that wouldn't work. Tillamook Rock is quite high enough! "

"It does look high," agreed the boy, following his father's gaze to where, over the port bow, rose the menacing and forbidding reef on which the light stood.

"It's the meanest bit on the coast," said the inspector. "Wouldn't you say the sea was fairly smooth? "

"Like a mill-pond," declared Eric. "Why? "

"That just shows you," said his father. "You'd have to nail the water down to keep it from playing tricks around Tillamook. Look at it now! "

The lad's glance followed the pointing finger. There was hardly a ripple on the sea, but a long slow lazy swell suggested a storm afar off. Slight as the swell was, it struck Tillamook Rock with a

vengeful spirit. Long white claws of foam tore vainly at the grim reef's sides and the roar of the surf filled the air.

"Mill-pond, eh?" said the inspector. "Well, I can see where I get good and wet in that same mill-pond."

He slipped on a slicker and a sou'wester.

"You'd better dig up some oilskins, Eric," he said. "Any of the men will let you have them."

The boy slipped off part of his clothes, standing up in undershirt and trousers.

"I like it better this way," he said.

The old inspector looked at his son with approval and even admiration. Considering his years, the lad was wonderfully well developed, largely as a result of swimming, and his summer with the Volunteer Corps had sunburned him as brown as a piece of weathered oak.

"I think I'd rather go in that kind of a costume myself," his father said, with a chuckle, "but I'm afraid it would hardly do for my official uniform on an inspection trip!"

As he spoke, the rattle of the boat-davits was heard.

"Come along then, lad," said the inspector. "Just a moment, though. Don't get any fool idea

about showing off with any kind of a swimming performance. You just be good and thankful to be hauled up by a crane!"

The boy took another look at Tillamook Rock, frowning above the surf.

"I'm not hankering after a swim there," he said; "I don't claim to be amphibious, exactly As you say, it's calm enough on the open water, but I don't think anything except a seal or a walrus or something of that kind could land on that rock. Not for me, thank you. I'll take the crane, and gladly."

The ropes rattled through the davit blocks, and, as the *Manzanita* heeled over a little, the boat took water, the blocks were unhooked, her bows given a sharp shove and she was off.

Down at water level, the slight swell seemed considerably larger. Indeed, it actually was increasing. And, as they pulled in toward the entrance of the reef, the boat met a rip in the current that seemed to try to twist the oars from the hands of the boat-pullers. But lighthouse-tender sailors are picked men, and though the little boat was thrown about like a cork, she fairly clawed her way through the rip. As they neared the entrance in the reef, the surf rushed between the rocks,

throwing up spume and spray as though a storm were raging. Eric had to look back out to sea to convince himself that the ocean was still as calm as it had seemed a moment or two before. In among the crags to which the boat was driving, there was a turmoil of seething waters, which came thundering in and which shrank away with a sucking sound, as though disappointed of a long hoped-for vengeance.

"It's like a witches' pot!" shouted Eric to his father.

"This is about as calm as it ever gets," was the inspector's unmoved reply. "You ought to see Tillamook when it's rough weather! I've seen it with a real gale blowing, when it seemed impossible that the rock could stand up five minutes against the terrific battering. Yet it just stands there and defies the Pacific at its worst, as it has, I suppose, for a hundred thousand years or more, and the light shines on serenely."

With consummate steering and a finer handling of the oars than Eric had ever seen before—and he was something of an oarsman himself—the boat from the lighthouse-tender neared the Rock. It was held immediately under the crane and a rope was lowered with a loop on the end of it. The in-

spector swung himself into this and went shooting up in the air, like some oilskin-covered sea-gull. He took it as a matter of course, all a part of the day's work, but, just the same, it gave Eric a queer sensation. It was his turn next.

In a moment the loop was down again for him. The rest of the boat's crew were busy getting ready the mail bag, the provisions and the other supplies that they had brought with them, so the boy stepped unhesitatingly into the loop.

Swish! He was on his upward flight almost before he knew it. The back curl of a breaker, baffled in its attack on the rock, drenched him to the skin. He laughed, for this was just what he had bargained for. Beneath him, already but a small spot on the sea, was the boat he had left; above him the grim nakedness of the barren rock, and below, snarling with impotent fury, was the defeated surf.

The crane above him creaked as it swung inboard. Drenched, cold, but thoroughly happy, Eric stood on Tillamook Rock. For the moment, at least, he was one with that little band of men which is Uncle Sam's farthest outpost against the tempest-armies of the western seas.

CHAPTER III

HEROES OF THE UNDERGROUND

KNOWING that his father had spent many years on Tillamook Rock, Eric was eager to see every nook and cranny of the building, and he importuned his uncle to go with him over the structure. But, although the inspector and the light-keeper were brothers, the trip was an official one, and his uncle deputed one of the assistant light-keepers to show the lad around.

Eric was not slow in making use of his time. He climbed up to the lantern and saw for himself close at hand the lens he had so often heard described, astonishing his guide with all sorts of questions. Most of these showed an extraordinary knowledge of lights and lighthouses, in which a mass of information was combined with utter ignorance of detail. This was due to the boy's long acquaintance with the Lighthouse Service through the several members of his family who had served in it.

"You know," said Eric, "I had the idea that Tillamook Rock would seem a lot higher, when one

was on top of it. When you look at it from the sea, it stands up so sheer and straight that it seems almost like a mountain."

"Well, lad," the assistant-keeper answered, "it is tolerable high. It's nigh a hundred feet to the level o' the rock, an' the light's another forty. It's none too high, at that."

"Why? The sea can't hurt you much, this high up!" said Eric, leaning over the railing of the gallery around the light and looking down. "Even a twenty-foot wave's a big one, and you're six or seven times as high up as that."

"You think we're sort o' peacefully floatin' in a zone o' quiet up here? You've got to revise your notion o' the Pacific quite a much! Neptoon can put up a better article of fight right around this same spot here than anywheres else I know. Maybe you didn' hear o' the time the sea whittled off a slice o' rock weighin' a ton or so and sort o' chucked it at the light?"

"No," said Eric, "I never heard a word about it. When was it?"

"Nigh about twelve years ago," the light-keeper said reminiscently. "It was the winter I got sick, an' I've got that night stuck good an' fast in my think-bank. There was a howlin' nor'wester

comin' down. She'd been blowin' plenty fresh for a couple o' weeks, but instead o' letting up, the sea kep' on gettin' more wicked. The way some o' the big ones would come dashin' in an' shinnin' up the rock as if they were a-goin' to snatch the buildin' down, was sure wearin' on the nerves. That winter, there was more'n once I thought the sea was goin' to nip off the lighthouse like a ball takin' off the last pin in a bowlin' frame."

"Dashing up against the lighthouse!" exclaimed the boy. "Aren't you putting that on a bit? Why you're over a hundred feet above sea level."

"In 'most any big storm the surf dashes up to the top o' the rock. But on this day I'm talkin' of, there was one gee-whopper of a sea. It broke off a chunk of rock weighin' every ounce o' half a ton, the way you'd bite off a piece o' candy, an' just chucked that rock at the lantern, breakin' a pane of glass, clear at the top of the tower."

The boy whistled incredulously.

"It's a dead cold fact," the other confirmed. "If you think I'm stretchin' it a bit, you read the Annual Report an' you'll find it's so."

"What did you do?"

"We put in a new glass," said the keeper.

"During the storm?"

"We haven't got any business to worry about storms, we've only got to keep the light goin'," was the reply. "If the End o' the World was scheduled to come off in the middle of the night, you can bet it would find the Tillamook Rock Light burnin'! Storm! Takes a sight more than a sixty mile gale an' a ragin' sea to stop a Light-house crowd. You know that yourself, or you oughter, with your folks. No, sir! There's no storm ever invented that can crimp the Service. We had that broken glass out and a new one in place, in just exactly eighteen minutes. It was some job, too! The chaps workin' on the outside had to be lashed on to the platform."

"Why, because of the wind?"

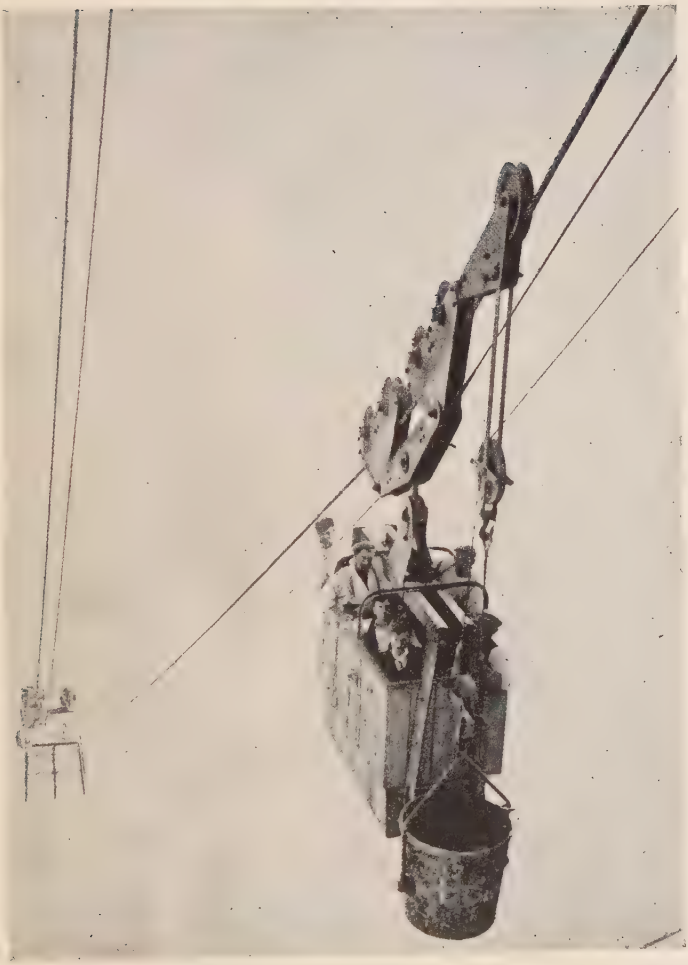
"Just the wind. That little breeze would have picked up a two-hundred-pound man like a feather."

"Weren't you scared?"

"No," said the light-keeper, "didn't have time to think of it. Cookie was scared, all right."

"Have you a cook on the rock?" said Eric in surprise, "I thought you all took turns to cook."

"The men do, in most o' the lighthouses," was the reply, "but Tillamook's so cut off from every-



SLIDING DOWN TO WORK.

Lighthhouse-builders on cableway from top of cliff to platform beside reef, unapproachable by boats.

thing that we've five men on the post. That means quite a bit o' cookin', an' so we have a chef all our own. Didn't you ever hear the story o' Cookie?"

"Never," said the boy, "go ahead!"

"Quite a while ago," the light-keeper began, "the Service hired a cook for Tillamook. He was a jim-dandy of a cook an' could get good money ashore. But he'd been crossed in love, or he'd lost his money, or something, I don't remember what, an' so he wanted to forget his sorrows in isolation."

"Sort of hermit style?" suggested Eric.

"That's it, exactly. Well, Cookie took the job, an' the tender tried to land him here. Three times the tender came out, an' each trip the sea was kickin' up didoes so that he couldn't land. He got scared right down to his toes an' they couldn't make him get into the boat. But each time he went back to town, after having renigged that way, his friends used to josh the life out of him.

"So, one day, when it was fairly calm, he said he would go. He'd been teased into it. The captain o' the tender chuckled, for he knew there was quite a sea running outside, but they started all right. Sure enough, soon as they rounded the cape, the sea was runnin' a bit. It didn't look so

worse from the deck o' the tender, an' Breuger—that was the cook's name—was telling the first officer how the world was going to lose the marvelous cookin' that he alone could do.

"But, as soon as Tillamook Rock come in sight, Cookie's courage began to ooze. He talked less of his cookin' and more o' what he called 'the perils of the sea.' As soon as the tender come close to the rock, he fell silent. The boat was swung out an' Cookie was told to get in. As before, he refused.

"'That's all right,' said the skipper, who had been expectin' him to back out. 'We'll help you. It's a bit hard climbing with the rheumatism.'"

"Did he have rheumatism?" asked the boy, grinning in anticipation.

"You couldn't prove he didn't have it!" responded the light-keeper with an answering flicker of a smile. "The captain turned to a couple of sailors. 'Give him a hand,' he said, 'he needs it.'

"Two husky A.B.'s chucked Breuger into the boat, an' before Cookie realized what was happenin', the boat was in the water an' cast off from the side o' the tender. But he had some sense, after all, for he saw there was no use makin' a fuss

then. It was a bad landin' that day, four or five times worse than this afternoon, an' I guess it looked dangerous enough to a landsman to be a bit scarin'. One of the men went up with him, holdin on to him, so he wouldn't get frightened an' drop, an' in a minute or two he was swung in to the landin'-place.

" There was one of our fellows here who was as funny as a goat, an' we had an awful time to keep him from raggin' Cookie. But we knew that Breuger was goin' to fix our grub for quite a spell and keepin' him in a good humor was a wise move. Anyway, when you're goin' to live in quarters as small as a lighthouse, you can't afford to have any quarrelin'. A funny man's all right, but he needs lots of room.

" So, instead of hazin' him for showin' the white feather so often, I praised Cookie for having made so brave a landin' on such an awful day. Quick as a wink, his manner changed. He just strutted. He slapped himself on the chest an' boasted of his line of warlike ancestors—seemed to go back to somewhere about the time of Adam. It never once struck him that every one else on the rock had had to make a landin' there, too. He gave himself the airs of bein' the sole hero on Tillamook. There

were days when this was a bit tryin', but we forgave him. He could cook. Shades of a sea-gull! How he could cook! We used to threaten to put an extra padlock on the lens, lest he should try to fricassee it!"

"Easy there!" protested Eric.

"Well," said the other, "you know the big Arctic gull they call the Burgomaster?"

"Yes, I've seen it in winter once or twice."

"Breuger could cook that oily bird so's it would taste like a pet squab. He used to take a pride in it, too, an' he liked best the men who ate most. Now I was real popular with Cookie. Those were the days for eats!" and the light-keeper sighed regretfully.

"How long did he stay?" queried the boy.

"That's just the point," the other answered. "He never went back."

"Never?"

"Not alive," responded the light-keeper. "He'd had one experience of landin' an' he'd never risk another. He stayed on Tillamook for over eighteen years, never leavin' it, even for a day. An' he died here."

"Well," the boy commented, "this is where I'm going to differ from Cookie, for there's Father

coming down." He looked over the edge. "It would make a great dive," he said, "if it weren't for the surf."

"It'd be your last," was the response. "Nobody could get out alive from that poundin'. More'n one good man's been drowned there. The first man that ever tried to build a lighthouse on this rock got washed off. That was the end of him."

"Tell me about it?" pleaded the boy. "There's just time enough!"

"Ask your dad," said the other; "he's got the early history o' Tillamook by heart. Meantime, I wish you all sorts of luck, lad, an' if ever you're in a Coast Guard vessel on this coast and see Tillamook flashin', don't forget the boys that never let a light go out!"

"Father," said Eric, a little later, when they had boarded the lighthouse-tender and got into dry clothes, "tell me the story of the building of Tillamook Lighthouse. They told me, over there, that you knew all about it."

"I ought to," the inspector replied, "I helped build it. And it was a job! I suppose Tillamook would be classed among the dozen hardest lighthouse-building jobs of the world."

"What would be the others?"

"Well, in America, on the Pacific Coast there's St. George's Reef. Spectacle Reef in the Great Lakes, and Minot's Ledge off Boston, were bad. There are a lot around England and Scotland, like Eddystone, Wolf Rock, the Long Ships, and Bell Rock—that's the old 'Inchcape Rock' you read about in school—and there was a particularly bad one called Or-Mar, in the Bay of Biscay. It took the engineer one year and a week before he could make the first landing on Or-Mar."

"Over a year!"

"A year and a week," the inspector repeated. "And Tillamook wasn't much better. It was in December 1878 that we got orders for a preliminary survey of the reef for the purpose of choosing a lighthouse site. After a dozen or more attempts, the engineer returned baffled. In the following June, six months later, the rock was still unviolated. No human foot had ever trodden it.

"Then the Department began to make demands. Washington got insistent. Urgent orders were issued that the rock would have to be scaled. The engineer was instructed to make a landing. Fortunately, toward the end of the month there came a spell of calm weather."

"Like the calm to-day?"

"Just about. That's as calm as Tillamook ever gets. After several more attempts, lasting nearly a week, the boat was run close to the rocks and two sailors got ashore. A line was to be thrown to them. No sooner were they ashore than the boat backed away, to keep from being stove in. Remembering that it had been six months before the boat had a chance of getting as near the rock as it had the minute before, the two sailors became panicky at seeing the boat back away. Both being powerful swimmers, they threw themselves into the sea and the boat managed to pick them up before the surf caught them.

"This had been enough to show that landing was not impossible. With the evidence that two sailors had ventured, the engineer could not withdraw. He was a bold and daring fellow himself. Two days later, although the sea was not nearly as calm, the boat was brought up to the rock again, and at almost the same landing-place as before, he succeeded in getting ashore.

"One of the things that makes Tillamook so dangerous is that you can never tell when it is suddenly going to change from its ordinary wildness to a pitch of really savage fury. A ground

swell, hardly perceptible on the surface of the sea, will kick up no end of a smother on the rock. The engineer lost no time in his survey. He had already made a study of the rock from every point of the sea around it, so that he was able to do his actual survey ashore quickly. Less than an hour was enough. By that time he had every detail needed for his report.

" But when he was ready to go, Tillamook was less ready to loose her capture. The waves were dashing over the landing place and the sky was rapidly becoming beclouded. Yet, for the engineer, there was no question of choice! To stay there meant being marooned, death from exposure and starvation. There was nothing to do but dare. The engineer, beckoning for the boat to come in as near the rock as possible, cast himself into the sea. It was touch and go, but we picked him up, although he was nearly done for when we got him. The report was duly sent into Washington and approved.

" The next thing was to arrange about the actual building. For this a man of skill and experience was needed. John W. Trewavas, a famous lighthouse expert, one of the constructors of the Wolf Rock Light off the English Coast, came to America

to pit his knowledge and his strength against the Pacific Ocean. Although it was summer weather, he hung around Tillamook for a month before there was even a chance to make a landing. Then, on September 18, 1879—I was steering the boat—Mr. Trewavas thought he saw his opportunity. I took the boat right in, so that her nose almost touched the rock. He leaped ashore, and, at the same instant, with a tremendous back-water stroke, the oarsmen jumped the surf-boat back out of danger. One second's—yes, half a second's—delay, and the boat would have been in splinters.

"The slope on which Trewavas had landed was wet and covered with slippery seaweed. Experienced and cautious, he waited for a moment to make sure of his foothold, well knowing the dangers of slipping. Peril was nearer him than he knew. A roller came breaking in, sending a spurt of water right over the spot where he was standing. So precarious was his footing that he did not dare move away quickly. Trewavas had just shuffled his feet a few inches further on that slippery slope when a comber heaved its great length along the rock. Almost without a curl it struck just below the landing and a boiling torrent of spume and spray hid the daring man from sight.

Just for a second, but when the wave receded, he was gone. The rock was empty."

"Couldn't you pick him up, Father?"

"We never even saw him again, in that whirlpool of currents. The undertow dragged him down immediately and he never came to the surface. The body was never found."

"Who was the next to land?" asked Eric.

"I was," his father said, "and I landed on exactly the same spot. I had taken off my boots, but even so, the seaweed was slippery and dangerous. Remembering poor Trewavas' fate, in a jiffy I was off the slope and on the level platform of the rock. They threw me a line from the boat, and I pulled ashore some tools and supplies. With a rope to help them, several of the men joined me. That was the beginning of the conquest of Tillamook."

"And did that sort of business last all through?" queried the boy.

"Pretty much. Once, when the lighthouse was about half built, the schooner on which the men lived, and which was anchored a little distance off the rock, was blown from her moorings. A revenue cutter picked her up and brought her back. I tell you the men who were still on the rock had a sure-enough scare when they saw the schooner

gone. They made sure they were marooned and done for. I had a job to keep them at work.

"Then there was another time, just when we were finishing the house, a terrific storm came up and the seas washed clear over the lower part of the rock. In the middle of the night there was an awful crash. Some of the men wanted to rush out to see what it was. I had to stand by the door with a revolver and threaten to shoot the first man who left."

"Why?"

"If they'd gone out, it's more than likely that some of them would have been washed or blown away, and I was responsible. In the morning we found that one of the tool-houses had been blown in. I watched those men like a hen does her chickens, and we didn't have a single accident in the building of Tillamook Rock Light after the work of actual construction was begun."

"You're sorry to say good-by to the old light, Father," said the boy sympathetically.

The old inspector roused himself from a reverie into which he had fallen.

"Yes," he admitted, "I am. But what the Commissioner says, goes! Of course it's always interesting to face new problems, and I'll have a

freer hand on the Lakes. It'll be easier for you to get home from the East, too, when you're at the Academy."

"That's providing I get there all right," agreed Eric. "Winning into the Coast Guard is just about the one thing I want most in the world."

"And like everything else in the world that's worth getting, you've got to work for it," his father added. "Well, here we are at the wharf again. This is probably the last time you'll smell the old Pacific, Eric, for in another week it'll be a case of 'Go East, young man, go East!'"

"I hope it isn't going to be too cold for Mother," the boy suggested.

"It'll be cold enough, don't you worry about that," the other answered, "I've heard enough about the Great Lakes. But it's a clear cold, not damp like it is out here. The cold won't hurt you, anyway. It'll give you a chance to harden up."

When, ten days later, Eric helped the family to settle in its new home in Detroit, the headquarters of the Eleventh Lighthouse District, he thought his fears of cold would be unfounded. The unusual beauty of the city of Detroit in the haze of an autumn afternoon, gave no sense of a rigorous winter. This feeling received a jolt, however,

Courtesy of U.S. Bureau of Lighthouses.

THE DEFIER OF THE PACIFIC.

Tillamook Rock, against which six thousand miles of ocean surges beat in vain.

when, strolling along the river front next day, he came across two of the huge ice-breaker car ferries, awaiting their call to defy Jack Frost. He was standing watching them, and trying to picture 'the Dardanelles of America' under the grip of ice, when a boy about his own age, with one arm in a sling, slapped him on the shoulder.

"Ed!" exclaimed Eric. "Who'd have thought of seeing you here!"

"Why not, old man?" said the other laughing, "I live here."

"Do you? Bully! So do I. The folks moved here yesterday."

"Your father, too?"

"Sure."

"I thought he'd never leave the Coast."

"He didn't want to," said Eric, "but he was appointed inspector in charge of this district, so he had to come. But what's happened to you," the lad continued, "what have you been doing with yourself?"

"Got my arm broken in a mine rescue," the other said.

"What kind of a mine rescue? An accident?"

"Coal-mine explosion."

"But what are you doing with coal mines?"

"I'm trying to qualify as a mining expert. You're not the only one who thinks Uncle Sam's the best boss there is. I'm going into the government, too."

"You are? In the Geological Survey?"

"Bureau of Mines," the other answered. "How about you? Still thinking of the Revenue Cutter Service—no, Coast Guard it is now, isn't it?"

"Yes, Coast Guard," Eric agreed. "You bet I'm going in, if I can make it. But the exams are the stiffest things you ever saw! I'm going to cram for them this whole winter."

"Isn't that great! I'm doing special work here, too. What's your end? Mathematics and navigation, I suppose?"

"Mostly mathematics," Eric replied. "What's yours?"

"Mineralogy and chemistry," his friend replied. "I'm going to try to specialize on the prevention of accidents in mines. I've got a good reason to remember my subject." He nodded with a certain grim humor to his bandaged arm.

"How did you do it?"

"I was down with a rescue party," said the older lad, "and we got caught. That was all."

With his characteristic impetuosity, Eric took hold of his friend's unbandaged arm and led him to a seat in Owen Park, just facing Belle Isle, the most beautiful island park in the United States. With his love of lighthouses, the Light at the northeast corner seemed to Eric like an old friend.

"There," he said. "Now you're going to sit right there, Ed, and tell me all about it. I've only had two or three letters from you since you left 'Frisco, and we were in First-Year High together."

"That's so," his friend agreed. "All right, if you've got to have the yarn, here goes." He leaned back on the bench, and began his story.

"You remember that Father was interested in mines?"

"Of course," Eric answered; "he showed me that little model of a colliery he kept in his study."

"You do remember that," the other said, his eyes kindling. "I helped him make it. It was a lot of fun. Dad was a crank on conservation. He was one of the first men in America to take it up. You know it was his influence that swung Washington into line? The waste in coal really used to worry him. He was always afraid of a coal famine, and he spent a lot of time doping out

ways to stop the waste in mining. He was just daffy about it, then."

"I can remember that, too," the boy said reminiscently. "He had pictures showing how quickly the coal was being used up, and how much coal every person in the United States was consuming, and all that sort of stuff. It was always mighty interesting to me. Your dad and I got along finely together."

"You did," his friend agreed. "Well, after a while, Dad decided to drop his business in 'Frisco and go mining. He'd always kept close tabs on the coal question, so that, when he got ready to start, nothing would satisfy him but small holdings in half a dozen parts of the country."

"What for?"

"You see, Dad wasn't trying to make a pile of money out of mining; he wanted to experiment with all sorts of coal and find some way to use it so that there wouldn't be so much waste. The locomotive, for instance, only converts about thirty per cent. of the coal into power. The other seventy per cent. goes up the smokestack. Same thing with an ocean liner."

"I know," said the boy.

"All right. So Dad bought a mine in Illinois,

and one in Manitoba, and took a half-share in some Minnesota mines and another in a Michigan mine. Then he joined a company in Pennsylvania, and I don't know what all. Anyhow, he's got stuff all over the place. It was out of the question for the rest of us to be traveling from mine to mine all the time, the way Dad jumps around, and so we settled here. It's sort of central for him.

"Being mixed up in such a lot of mines, Dad had a chance to work out some of his pet schemes. He'd always been enthusiastic over the government's relations with the miners, and when it started rescue work, he was one of the first to equip a rescue car and ask some of the experts to come out and instruct his miners how to handle it. You know Dad—everything he does, every one else has got to do?"

"He always was like that," Eric agreed.

"He's that way still. So, of course, I was elected to that first-aid business right away. I had to know it all! There's nothing half-way about Dad. Cæsar's Ghost! How I slaved over that stuff! Luckily for me, they sent out a cracker-jack from Washington, and it was such good sport working with him that I soon picked it up. The next move was that I should go from one to an-

other of Dad's mines and organize the rescue work. I've been doing that for the last year."

"I should think that was bully!" exclaimed Eric. "But how do you do it?"

"It's easy enough to start." The young fellow laughed. "I'm a regular rescue 'fan' now. I usually get two or three teams together and have a match. Talk about your kids on a baseball diamond in a vacant lot! Those miners' rescue teams have the youngsters skinned a mile for excitement when there's a rival test."

"But I don't see how you could have a fire-rescue match," said Eric, puzzled, "you can't set a mine on fire just to have a drill!"

"Scarcely! At least, you can't set a whole mine on fire. Once in a while, though, you can use an old mine shaft. But we generally do it in the field. There the entries and rooms are outlined with ropes on stakes. Across the entrances of these supposed rooms crossbars are laid, just the height of a mine gallery.

"The contest is to find out how good the men are, individually, and to teach them team work. Each man has a breathing apparatus, and a safety and electric lamp, while each crew has a canary bird."

"A what?"

"A canary bird!"

"What kind of a machine is that?" asked Eric, thinking the other was referring to some name for a piece of rescue apparatus.

"A canary bird? It's a yellow machine with feathers, and sings," said Ed, laughing.

"You mean a real canary bird?"

"Yes, a live one."

"But what the crickets do they need a canary bird for?"

"To give them a pointer as to when the air is bad. You see, Eric, there's all sorts of different kinds of poisonous gases in coal mines. Some you can spot right off, but there's others you can't."

"I thought gas was just gas," Eric answered, "'damp,' don't they call it?"

"There's several different 'damps.' Take 'fire damp' or just plain 'gas' as the miners call it. That's really methane, marsh gas, the same stuff that makes the will-o'-the-wisp you can see dancing around over a marsh. It'll explode, all right, but there's got to be a lot of it around before much damage'll be done. 'Fire damp' is like a rattlesnake, he's a gentleman."

"How do you mean?" queried the boy.

"Well, just the same way that a rattler'll never strike before giving you warning, 'fire damp' always gives you a chance ahead of time."

"How?"

"You know every miner carries a safety lamp?"

"Yes."

"'Fire damp' makes a sort of little cap over the flame of the lamp, like a small sugar-loaf hat. As soon as a miner sees this, he knows that there's enough 'gas' around to make it dangerous. As it's a gas that it doesn't do much harm to breathe, you see he can always make a get-away. Isn't that being a gentleman, all right?"

"Yes, I guess it is."

"Then there's 'black damp.' That's ordinary carbon dioxide, or carbonic acid gas."

"Isn't that just the stuff we breathe out?" questioned Eric.

"Exactly," his former schoolmate replied. "In an old mine, though, you've got to remember, nearly all the oxygen is absorbed by the coal. That gives a lot less chance for a leak of carbonic acid gas to mix with enough oxygen to keep the air pure. For 'black damp' though, the lamp's a

good guide again. When a miner sees that his lamp is beginning to burn dim, it's a sign the air's short of oxygen."

"Of course," said Eric, "we used to have that experiment in our high school chemistry."

"We did. But do you remember just how much oxygen a lamp has to have?"

"No," the boy was forced to admit, "I've plumb forgot."

"A safety lamp will go right out with less than seventeen per cent. of oxygen, while a man can live fairly comfortably on fifteen or sixteeen per cent. So the flickering out of a lamp is a sure sign that the danger line's not far off."

"It's a gentleman, too, then," said Eric with a laugh.

"Yes," the other assented dubiously, "but there's less margin. Now, 'white damp,' or carbon monoxide, is a horse of a different color. That's the real danger, Eric. Pretty nearly all the cases of poisoning in mines are due to 'white damp.' Just the other day, in Pennsylvania, two hundred men were killed—whouf!—just like blowing out a match. But 'white damp' hasn't got any effect on the flame of a safety lamp. If any-

thing, it may hit it up even a trifle brighter. So the lamp isn't any good. That's where the mice come in."

"Mice? I thought you said canaries!"

"We use both mice and canaries. When you haven't got a canary, take a mouse."

"Which is the better?"

"Canary! 'White damp' catches him quicker. That means he gives an earlier warning. A canary will fall off his perch in four minutes when the air's only got one-fifth of one per cent. of 'white damp.'"

"And how long could a fellow stand that much of the gas?"

"About ten minutes, without being really put to the bad, though twenty minutes of it would make him mighty sick. You see, that gives a party six minutes clear before any harm's done. Any time a canary gives a warning, if the miners turn back right then and there, nobody'd be hurt. Isn't that a great little alarm, though?"

"It is that," Eric agreed. "But what happens to the canary?"

"Oh, he comes around again in about five minutes. If a bird gets too much 'white damp,' though, he loses some of his value, because he gets

Courtesy of U.S. Bureau of Lighthouses.

A Beacon Masked in Ice.

Racine Reef Light, in the Great Lakes, where navigation has perils unknown to the open sea.

immune and can stand almost ten minutes. So you see, Eric, the ' yellow machine with feathers ' can be a real help sometimes."

" Great! " said Eric, " I'll always look at a canary with respect after this. But I've been taking you away from the yarn, Ed, with all my questions. You were telling about the drill."

" So I was. Well, as soon as all the men are fitted up and the teams are ready, a signal is given. All the men are examined for their general health, their heart, pulse, breathing and all that sort of thing, and then they are made to get into the special helmet and sent into a smoke-house filled with the worst kind of fumes. They have to be there ten minutes. When they come out, the doctor examines them again. If any man shows poor condition, his team is penalized.

" Then all the lights are fixed up and examined, and there's a sure enough penalty if any one slips up on the lamp test. After that, a team is sent on the run to fetch a miner who is supposed to be lying unconscious in a working. No one knows where he is. The team to find him quickest and bring him back counts one point. Then the unconscious man is supposed to be revived. The team that does that best gets another point and so on."

"Real first-aid stuff," said Eric.

"You bet. We question the miners swiftly on accidents and they have to know bandaging and everything else. Running stretchers in a working that's only three feet or three feet six high isn't any joke."

"Are the galleries as small as that?" said Eric in surprise. "How can you stand up?"

"You can't. In lots of mines the men work all day long and never get a chance to straighten their backs. Then, in a really big drill, a miner is supposed to be imprisoned by a fall of roof. The team has to find him, to inspect the roof, to show how it should be timbered, and to put out a supposed fire in one of the workings. I tell you, a man who has a certificate from the Bureau of Mines as a trained mine-rescue man is trained all right. It was in one of those drills that I got hurt."

"Oh," cried Eric, disappointed, "I thought it was a real accident!"

"It was," his friend answered. "I said it was during a drill, not at one. It was in Central Pennsylvania. The contest was going ahead in good shape, when a chap came tearing down the road in a wagon, his horses on the gallop.

" ' Explosion in the Eglinton, Shaft Three! ' he called as soon as he got within hearing. ' There's hundreds of men caught! '

" Everybody looked at me. I wasn't a government man, and I was only there because I had trained most of the teams. I'm willing enough to be the whole thing, but after all I've got some gumption, and I wasn't going to take hold of something that needed an experienced man's handling. There was one old operator there, on one of the judging committees. He'd been watching me closely. ' Mr. Barnett,' I said hurriedly, ' will you take charge? '

" I tell you, Eric, you should have seen his face change! He jumped forward with a cheer. With a word here, an order there, in two minutes' time he had that wagon off again with two rescue teams fully equipped, himself leading, and I was heading all the rest of the men on a steady dog-trot to the place. Old man Barnett was a leader, all right!

" When we got to the mine shaft, it was surrounded by women, some crying, but most of them silent. The two rescue crews had been working like fiends, and work was needed, too.

" I didn't see how I could be much use, anyway.

The miners were 'way ahead of me. I haven't had enough experience underground. Just the same, as soon as Barnett saw me, he shouted,

"'Down with you, boy!' and down I had to go.

"As I passed him, I said,

"'Mr. Barnett, I don't know much about the practical end of this!'

"'I know ye don't,' he answered grimly, 'ye don't have to. But men always need a leader. Get on down!'

"As soon as the bucket rattled me to the bottom of the shaft, I fixed on my apparatus, ready to start with the rest of my team. I'd been through that mine once and the comment I'd heard at the pit mouth had told me where the trouble was, so we started off boldly.

"We went 'way in and met one of the parties coming out with a stretcher. We were near enough to make signs to them, just visible in the dull gloom of dimly burning safety lamps when, woof! down came a mass of roof. I saw it coming and dodged back, but not quite in time, for a chunk of coal caught my shoulder. It twisted me round so that I fell with my left arm stretched out, and then a big chunk rolled full on me, just above the wrist."

"Broke it?"

"Yes, quite a nasty smash,—a comminuted fracture, the doctor called it. My boys snaked that coal off and got me up in a hurry, but the party with the stretcher was cut off. That fall of the roof had choked up the passage solid. The men were already at work at it, using their pickaxes like demons. Seeing I couldn't do any good with a broken arm, I ran back for reënforcements."

"Didn't your arm hurt like blazes?"

"I suppose it did, but I don't remember noticing it much at the time. I got back to the mine entrance and steered another gang to where the cave-in had occurred. But what do you suppose I found when we got there?"

"What?" called Eric, excitedly.

"My men were poisoned!"

"How?"

"White damp."

"You mean they were dead?" exclaimed the boy, horror-stricken.

"No, they were all at work," said the other, "but they were pickaxing the rock in a listless sort of way that I recognized at once. You see, I'd done quite a bit of reading along those lines —Dad was so keen on it—so I could tell at once

that they'd had a dose of carbon monoxide, and a bad dose at that.

"'Come back, boys!' I cried. 'Come back! The place is full of 'white damp'!

"But they were a plucky lot of fellows. Their comrades were entombed on the other side of the cave-in and they wouldn't quit. And all the while they were breathing in the fumes."

"So were you!" exclaimed Eric.

"Yes, but I wasn't working. I couldn't do much, with my arm all smashed up, and so I wasn't breathing in as deeply and taking in as much of that stuff as they were. I urged them to come back, but they were Americans, and wouldn't give in as long as there was any hope of rescue.

"Then I ordered them back. I think they thought I was crazy. I picked up a shovel and threatened to smash it across the face of the first man who didn't follow orders. They grumbled, but, after all, they'd been well trained and they knew that they had to do what the leader ordered. The second gang that had come up had its own leader, you see, and he told them to go on. That made my men all the harder to handle, but I brought them back.

"Just as we got near the mine entrance, one of

the men collapsed. That gave me an awful scare. I sent one of the men up to tell Barnett, while I ran back into the workings."

"What for?"

"To try to get that second gang back, anyway."

"But wasn't it an awful chance to take, to go back into that stuff?"

"Who bothers about chances?" exclaimed the other. "But I took the canary!"

"Well?"

"I wasn't more than half-way to the gang when the bird began to quiver and just as I reached them, it fell off the perch. I held out the cage. That was all the proof I needed."

"'Guess the kid's right,' the foreman of the gang said. 'Go back, boys.'

"They raised a howl with him the same way that my own men did with me. But he was an old-timer, and without wasting any words, he smashed the foremost of the workers across the jaw. Under a torrent of abuse, the men fell back. I was half-way to the entrance when everything turned black before me. Next thing I knew, I was in the Mine Superintendent's house with a trained nurse."

"White damp?" queried Eric.

"That's what the doctor said."

"What happened to the imprisoned bunch?"

"Old Man Barnett had just reached the entrance to the working with a large rescue party all equipped with breathing apparatus, when I collapsed. He got the trapped men out."

"I should think they'd have been poisoned for fair," said Eric.

"Not a bit of it," his friend replied. "The leak of white damp had all come on the outside of the roof-fall, and there was hardly any of it on the other side. Some of the men were pretty weak from lack of air and that sort of thing, but not seriously hurt. It was the rescuers who suffered."

"How was that, Ed?"

"Three of the five men who were in my gang died," said the other mournfully.

"Great guns! Died?"

"Yes," the young miner said, "poor fellows, they went under. Another man and I were the only ones who got over it."

"Died in saving others! That's sure tough!" There was a pause, and Eric added, "What got you two clear?"

"The other chap had been lying full length on

the ground, while working, and as white damp rises, he had breathed less of the gas than the others. I wasn't able to work, so I didn't have to breathe deep." He looked down at his broken arm. "It's a queer thing," he said, "but it was breaking my arm that saved my life."

CHAPTER IV

SNATCHED FROM A FROZEN DEATH

"FATHER! Father! What do you think?" cried Eric, bursting into the sitting room at breakfast one morning, a couple of weeks after his encounter with his young mining friend, "I'm going into the Life-Saving work right away!"

"What's the excitement?" his father asked, speaking for the rest of the family. "Cool down a bit, my boy, and tell us all about it."

"I've—I've just got a letter from the Captain Commandant," replied Eric, fairly stuttering in his haste to tell the good news, "and he says I can enlist in one of the lake stations until the close of navigation. I'll get some real practical training that way, he says, and then I can take up prep. work for the Academy all winter."

In view of the fact that there had been considerable correspondence between the ruling head of the Coast Guard and Mr. Swift, the old inspector was less surprised than the boy expected. Not for the world would the lad's father have let him think that there had been any consultation about this

plan. He wanted the boy to have the sense of being "on his own"!

"I remember now," he said, "you said something about writing along that line a couple of weeks ago."

"I did write, Father, I did want so awfully to get a chance. But I hardly believed that they'd actually let me do it."

"I don't see why they wouldn't. After all you told me about your swimming, they ought to have made a special bid for you," he added smiling.

"You don't mind my going, do you?"

"I'm perfectly willing, my boy," his father said. "I'm sufficiently on to your curves, Eric, to know that it isn't much use trying to pin you down to books while there are a few weeks of summer left. You'll be out of mischief at a Coast Guard station, that's one sure thing. I think I'll take you out to meet old Icchia, the veteran of the Lakes. He holds the record for one of the most sensational rescues in the history of the service. I've often heard your Uncle Jim tell the story, but I won't spoil the yarn for you by telling it myself, I'll let Icchia do that."

"When can we go to see him, Father?"

The old inspector smiled at his son's enthusiasm.

"It happens that I've got to start off on an inspection trip to-morrow, which will take me away for a week or so," he answered, "so, if you have no other plans, we might go to-day."

"I'll get ready now!" cried Eric, jumping up from the table.

"You'll do nothing of the kind," his father said rebukingly, while his mother smiled at the boy's impetuosity, "we won't go until after lunch, that is—if you can wait so long!"

"All right, but isn't it bully!" and, unable to contain himself, Eric launched into a panegyric of the Life-Saving Service, most of the history of which he knew by heart.

The lad's excitement increased tenfold when, that afternoon, they approached the little cottage of the old keeper. It was right on the seashore in an outlying suburb looking out over the peaceful stretch of Lake St. Clair.

"Mr. Icchia," said the old inspector, after greetings had been exchanged, "my boy here is going to join one of the lake stations and, to give him an idea of what the service can do, I want you to tell him the story of that night off Chocolay Island."

"It's a deal like beatin' a big drum," began the

old keeper in a quavering voice, "to bid an ol' fellow like me tell of his own doin's!"

"But you're not doing it to show off," Mr. Swift said, "I wouldn't ask you to do that. It's because I know you think a good deal of the Service that I wanted my boy to meet you, and to hear a real story of life-saving told by one of the men who was in it."

"It wasn't so much at that—" the old man began. But the lighthouse inspector interrupted.

"Spin the yarn, Icchia," he said, "it's a poor trick to make a lot of excuses! Besides, it spoils the story."

Now the old keeper had a firm belief in his own value as a story-teller and it piqued his pride to have it thought that he was spoiling a good yarn, so without further preamble he began.

"I don' know what the world is comin' to," he said, after he had filled his pipe and lit it, "but there's no sech winters to-day as there was in my young days. I kin remember, when I wasn't no older'n that bub there, there was more snow in one winter 'n we have in five, now; an' Lake Huron was always friz up. Life-savin' was a lot harder in them days, ye'd better believe me, an' not only in the winter but all year round."

"Why?" asked the boy.

"There wasn't no sech lights then as there is now, for one thing, an' a skipper had to keep his eyes peeled an' his lead goin'. An', for 'nother thing, in the days I'm talkin' of, they was mostly all sailin' craft. Now I'm not sayin' nothin' in favor of steamers—I was raised on an ol'-time clipper. I will say that when a gale ain't too bad, a steamer kin handle herself more easy-like 'n a sailin' craft, when there ain't but a little seaway. But when she's blowin' good an' strong, an' the gale's got more heft 'n a steamer's screws, what use is her machines to her?"

"Not much," said the boy.

"Ye're sayin' it," the old keeper continued. "An' in the ol' days, when steamers first run on the Lakes, they weren't no such boats as ye see now. Our worst wrecks in them days were the steamers. This one, that your pappy wants me to tell ye 'bout, was a steamer an' a three-masted fore-an'-after she had in tow.

"This yarn I'm a spinnin' reely begins down at Marquette Breakwater. It was on the seventeenth day of November, an', let me see, it must have been in 'eighty-six, the same year my youngest was born. The winter had broke in early that year,

Courtesy of U.S. Bureau of Lighthouses.

WRECKS! AND THE ICE BETWEEN!

Steamer ashore near St. Joseph, Mich., under conditions all but impossible for life-saving, yet not a soul was lost.

not with any reel stormy weather, but jest a bunch o' pesky squalls. An' cold! We was in the boat mighty near every day, an' I used ter forget what bein' warm felt like. There was allers somethin' hittin' a shoal or tryin' to make a hole in the beach. It was squally an' shiftin', ye see. An' the mush-ice set in early."

"What's mush-ice?" interrupted Eric.

"Mush-ice," said the old keeper, "is a mixture of frozen spray, an' ice, an' bits o' drift, an' everythin' that kin freeze or be friz over, pilin' up on the beach. It's floatin', ye understan', an', as a rule, 'bout two or three foot thick. Owin' to the movin' o' the water, it don't never freeze right solid, but the surf on the beach breaks it into bits anywheres from the size of 'n apple to a keg. An' it joggles up 'n' down, 'n' the pieces grin' agin each other. It's jest a seesawin' edge o' misery on a frozen beach."

"That's as bad as Alaska!" exclaimed the boy.

"It's a plumb sight worse," the other answered. "I ain't never been no further north 'n Thunder Cape, jest by Nipigon. An' what's more, I ain't goin'! But even up there, the ice freezes solid 'n' you kin do somethin' with it. Mush-ice never gits solid, but like some sort o' savage critter born o'

the winter, champs its jaws of ice, waitin' for its prey."

"How do you like that, Eric?" asked his father. "That's some of the 'fun' you're always talking about."

"Can't scare me, Dad," replied Eric with a laugh. "I'm game."

"Ye'll need all yer gameness," put in the old life-saver. "Wait till ye hear the end o' the yarn! As I was sayin', it was in November. The fust big storm o' the winter broke sudden. I never see nothin' come on so quick. It bust right out of a snow-squall, 'n' the glass hadn' given no warnin'. We wa'n't expectin' trouble an' it was all we c'd do to save the boats. Ye couldn't stand up agin it, an' what wasn't snow an' sleet, was spray.

"All mornin' the gale blew, an' in the middle o' the afternoon the breakwater went to bits. The keepers o' the light at the end o' the breakwater lighted the lantern, 'n' you take my word for it, they were takin' their lives in their hands in doin' it. Jest half 'n hour later, the whole shebang, light, lighthouse, 'n' the end o' the breakwater, went flyin' down to leeward in a heap o' metal 'n splinters.

"Jest about that time, some folks down Choco-

lay way, lookin' out to sea, took a notion they saw what looked like white ghosts o' ships 'way out on the bar. She was jest blowin' tiger cats with the claws out! 'Twa'n't a day for no Atlantic greyhound to be out, much less a small boat. But I tell ye, boy, when there's lives to be saved, there's allers some Americans 'round that's goin' to have a try at it. Over the ice 'n' through the gale, eight men helpin', the fishermen o' Chocolay carried a yawl an' life-lines to the point o' the beach nearest the wreck. Four men clumb into her."

"Without cork-jackets or anything?" asked Eric.

"Without nothin' but a Michigan man's spunk. Well, siree, those four men clumb into that yawl, an' a bunch of others jumped into the mush-ice an' toted her 'way out to clear water. With a yell, the fisherman put her nose inter the gale an' pulled. But it wa'n't no use. No yawl what was ever made could have faced that sea. The spray friz in the air as it come, an' the men were pelted with pieces of jagged ice, mighty near as big 's a bob-cherry. Afore they was ten feet away from the mush, a sea come over 'n' half filled the boat. It wa'n't no use much ter bail, for it friz as soon 's it struck. They hadn't shipped more'n four seas

when the weight of ice on the boat begun to sink her."

"Fresh water, of course," said Eric. "It would freeze quickly. I hadn't thought of that."

"In spite o' the ice," continued the veteran of seventy Lake winters, "two o' the men were for goin' on, but the oldest man o' the crowd made 'em turn back. He was only jest in time, for as the yawl got back to the edge o' the mush she went down."

"Sank?"

"Jest like as if she was made o' lead."

"And the men?" asked the boy eagerly.

"They was all right. I told you it was nigh the beach. The crowd got to the yawl 'n' pulled her up on shore. They burned a flare to let 'em know aboard the wrecks that they was bein' helped an' to hold out a hope o' rescue, but there wasn't no answer. Only once in a great while could any one on shore see those ghosts o' ships 'way out on the bar. An' every time the snow settled down, it was guessin' if they'd be there next time it cleared away, or not.

"Seein' that there was nothin' doin' with the yawl, the crowd reckoned on callin' us in to the deal. We was the nearest life-savin' station to

Chocolay bar, an' we was over a hundred miles away."

"A hundred miles!"

"All o' that an' more. We was on Ship Island, six miles from Houghton. As I was sayin', seein' that nothin' could be done from their end, Cap'n John Frink, master of a tug, hiked off to the telegraph office at Marquette, 'n' called up Houghton. That's a hundred 'n' ten miles off, by rail. He told 'em o' the wrecks 'n' said he thought as we could get 'em off if we could come right down. The wires were down between Houghton 'n' Ship Islan' and there wa'n't no way o' lettin' us know. The operators sent word all over, to try an' get a message to us, an' mighty soon nigh everybody on the peninsula knowed that we'd been sent for.

"The skipper of a big tug in Houghton heard about it, jest as he was goin' to bed. He come racin' down to the wharf an' rousted out the crew, His engineer was still on board an' they got steam up like winkin'. The gale was blowin' even worse up our way, but the old tug snorted into it jest the same. Out into the dark an' the snow an' the storm she snubbed along, tootin' her whistle like as if it were the Day of Jedgment. An' if it had

been," continued the old man in parenthesis, "no one would've known it in that storm!"

"When did you see the tug?" queried the boy.

"Couldn't see nothin'," was the answer, "we jest heard that ol' whistle toot. One o' the men guessed it was the big tug all right an' wondered if she was ashore somewheres with a tow. But, fust thing we know, she come up out o' the muck o' snow an' sleet an' the ol' skipper bellered to us through a speakin'-trumpet that he was come to take us to a wreck. We snaked the gear on to that tug in about half no time, takin' the big surf-boat an' all the apparatus. The tug was a blowin' off steam, like as if she was connected to a volcaner. I tell you there must have been some fire under them boilers. An' when we started—I'm an old hand, boy, but I'm tellin' ye that I never thought to see Houghton. The ol' skipper sent that tug through at racin' speed like as if it was a moonlight summer night an' he had all the sea-room in a couple of oceans.

"'Air ye goin' to stop at Houghton?' I asks him, sort o' sarcastic, 'or are ye gittin' up speed enough to run on a mile or two after ye hit the shore?'

"'Don't ye worry,' he said, with a short laugh,

' ye c'n tie my ears an' eyes up doorin' a hurricane, 'n' I can smell my way to port! '

" An' I'm tellin' ye he did. Without nary a light nor nothin' to guide him—for the snow was worse 'n any fog—he went full speed ahead. An' when he tinkled that little telegraph bell to the engine room, I was wonderin' if he was within ten miles o' the place. But as that craft slowed down, ye can b'lieve me or not 's you like, she glided up to her own pier like as if it was a ferry-boat in a dead calm.

" ' I've got to hand it to you, Cap'n,' I says to him, ' I wouldn't ha' believed it unless I seen it.'

" ' That's my end,' say the cap'n, ' I know my work, same's you know yours. I'm bettin' my pile on you fellers makin' good 'most any ol' time.' Made me feel good, all right."

" It sure does make a difference," put in Eric, " when you know that people have confidence in you."

" Right you are, boy," said the old keeper, and continued his story. " That pier was jest a mass o' folks, thick as they c'd stand. An' when they saw the tug with us on board, they cheered, 'n' cheered, 'n' cheered. There was a dozen to grab the lines 'n' make 'em fast, 'n' before she was even

tied up, a mob grabbed our boat an' apparatus an' rushed it to the railroad.

"While we was a-comin' over the strait, the superintendent o' the railroad division was got up, 'n' told all about the wreck. He was a spry man, too, 'n' by the time the tug was in, he had orders out to clear the track 'n' a special train was waitin' in the station. She was ready fitted up with a couple of open cars for the boat an' apparatus, an' one coach for us.

"They didn't let us touch nothin'.

"'Keep your strength, men,' the superintendent said to the crew, 'my boys will put your stuff aboard.'

"They did. That boat an' the apparatus an' everything else was aboard that special, jest about as quick as we could climb into the cars. We had a special train all right! She jest whizzed along that track, not worryin' about nothin'. Signals didn't matter, for the track had been cleared in advance. The superintendent had come on the train with us. He'd wired ahead to Marquette, an' when we slowed up there was another bunch in the station to welcome us. The train was covered in ice an' snow, an' the front of the locomotive looked like a dummy engine made out o' plaster o' Paris.

"The station was alive with men, all just on edge with waitin'. They had sleighs but no horses, the footin' was too bad. An' so the boat an' the apparatus-car was put on the sleighs, an' the men dragged it along themselves at a whole of a clip! They wouldn't even let us walk, but toted us along in a sleigh, too."

"Why?" asked Eric.

"To keep us from bein' tired. We needed all the strength we had. An' we made good time, I'm tellin' ye. They carried out the boat an' the cart to the beach an' then their end of it was done. It was up to us, now. An' I tell ye, I was anxious. There was somethin' mighty thrillin' in that wild train ride through the night. I've often run big chances in a boat, but this was different-like. Usooally no one knows what we're doin', but this time, the news was bein' flashed all over the country.

"When we actooally got on the beach it didn't look so bad. The boats were lyin' right on the bar 'bout two hundred 'n' fifty foot, off shore. We rigged the gun, loaded her, 'n' fired. I dropped a line jest abaft the pilot-house, where we figured the men must be waitin'. It was a good shot an' I reckoned that there wa'n't goin' to be no trouble

at all. It heartened me right up. We'd got there in time, an' first crack out o' the box, there was a line, right across the steamer. The path o' rescue had been made!

"But there was one thing I hadn't figured on."

"What was that?" queried Eric excitedly.

"The weather 'n' the cold. The seas had come up, over 'n' over that steamer, until the decks were one straight glare of ice. There wa'n't nothin' a man could get hold of. If a sailor stepped out on that ice, he couldn't stand, for she was heelin' over to port like the side of a hill. An' the lee bulwark was torn away. Worst of all, the waves kep' a dashin' over 'n' over without stoppin'. Our line wa'n't more'n fifteen feet from the pilot-house, but no one couldn' get to that line without bein' washed off.

"In a way, we'd done all that was necessary. We'd dropped a line where they'd ought to be able to get it. We couldn't know there wa'n't no way for 'em to do it. But when the minutes went by 'n' there was no sign from the steamer, it begun to look bad. If it hadn't been for the ice on the decks they was as good as rescued, but with the way it was, they wa'n't no better off, even with rescue fifteen feet away, than when our crew was a

Courtesy of U.S. Coast Guard.

LAYING THE LYLE GUN.

Courtesy of U.S. Coast Guard.

FIRING THE SHOT AND LINE.

Note line being paid out from the faking-box. This shot carried a sixth of a mile.

hundred miles off in Ship Island. There wa'n't nothin' for us to do but tackle the job ourselves.

"The fishermen, the ones that had been out in the yawl, came aroun' an' said it couldn't be done. My coxswain agreed it couldn't be done, but we'd do it just the same."

"And you?" asked the boy.

"I jest started gettin' the boat ready," the old keeper said, simply. "It was 'way after midnight, reckon it was nearly one o'clock, an', if anything, the sea was wilder. An' I felt nothin' so cold afore in all my life. The women o' Chocolay, they was out that night, bringin' steamin mugs o' coffee. There's a deal o' credit comin' to them, too, the way I look at it."

"I don't see that they could have done much less," said Eric.

"Maybe aye, maybe no," said the veteran, "but I reckon, no matter how little a woman does, the right kind o' man's goin' to think it's a lot. Well, as I was sayin', I turned to the boys to launch the boat. We got hold of her by the rails an' waded in through the mush-ice, same as the fishermen had done. I tell you, it guv me a big sense o' pride in men like our Michigan fishermen when I tackled what they'd tackled. They hadn't

no cork-jackets, and they wa'n't rigged up for it. Their boat wa'n't built for no such work but they didn't stop to think o' their own lives or their own boat. An' a fisherman's boat, like's not, is all he's got to make a livin' with. It makes a man feel good to think there's other men like that!

"That mush reached two hundred yards f'm land. I don't know how them fisher chaps ever got through the ice at all. It took us nigh half 'n hour to make the last hundred yards. When the water deepened so's we could get into the boat, every man's clothes was drenched an' they friz right on to him. Every time we dipped the oars in that mush they'd stick, 'n' onless we'd pulled 'em out mighty fast they'd have friz right there. 'Bout every ten yards we had to chop the oar-locks free of ice an' the only part of our slickers what wa'n't friz was where the muscles was playin'. The cox'n, he looked like one of them petrified men ye read about.

"At last we got through the mush. All the way through it, with the load o' floatin' ice 'n' muck, the sea wa'n't tossin' much. But jest the very minute we got clear of it an' started out, the sea hit us fair. I was pullin' stroke an' it didn't git me so hard, but the cox'n, who was facin'

bow, got it full. The wind was dead ahead an' the sea was a-tumblin' in as if there wa'n't no land between us an' the North Pole.

"The blades o' the oars got covered with ice, makin' 'em round, like poles, instead of oars, an' we couldn't get no purchase. I hit up the stroke a bit, exhaustin' though it was, 'n' maybe we made about twenty feet further. She was self-bailin' or we'd ha' been swamped right away. Every sea that come aboard left a layer of ice, makin' her heavier to handle. Then, suddenly, along comes a sea, bigger'n any before, an' it takes that lifeboat 'n' chucks us back on the mush-ice, bang! The shock smashes the rudder 'n' puts us out o' business. I forces the boat ashore for repairs.

"'Too bad,' says the railroad superintendent, to me; 'for a minute, there, I thought you were going to make it.'

"'We jest are goin' to make it,' says I, 'if we have to swim!'

"Then one o' those fisher chaps had a good idee. While we was a-fixin' up the rudder an' gittin' ready for another trip, the rest o' the crowd chops the ice off'n the boat, 'n' off'n the oars. Then this fisher chap I was a tellin' about, he

comes back with a can of tallow an' smears that thick all over the boat an' the oars an' our slickers an' near everything that he c'd find to put a bit o' tallow on."

"What was that for?" queried Eric.

"So as the water'd run off, o' course," the old man answered. "It worked, too. In about twenty minutes we was off again, in the mush-ice, jest as afore. We hadn't had no chance to get warm, an' our clothes was wet an' friz. I thought sure some o' the men would be frost-bit. But I guess we was all too tough.

"The second trip started jest the same. As soon as we got out o' the ice a breaker come along 'n' hove that boat 'way up, 'n' then chucked it back on the ice, smashin' the new rudder same's the old one.

"I wa'n't goin' to have no monkey-business with rudders any more, 'n' I yelled to Brown, he was the cox'n,

"'Take 'n oar, Bill!'

"He grabs a spare oar 'n' does all he knows how to steer with that. Again we druv our oars into it an' got out o' the ice, 'n' again it threw us back. We did that five times 'n' then one of the fellers got hurt, when his oar struck a chunk of

ice, 'n' we went ashore again. I reckon we'd been at it nigh four hours, then."

"I suppose you hadn't any trouble finding a volunteer?" the boy said.

"We could ha' got nigh every man on the beach. But we took one o' the fishermen who had gone out on his own hook afore. If we was goin' to do any savin' it was on'y fair he should have a share o' the credit. An' then, any chap who was willin' to resk his life in a bit of a yawl in that weather was worth puttin' in a boat.

"So we'd had to make three starts afore we really got away an' clear o' the ice. I never see no such gale in all my days. It was an hour an' more, steady pullin' with every pound o' muscle in the crew, before we got in reach o' the tug. An' then, when we was right up on her, there wa'n't one man aboard who come out to catch a line. We found out why, arterwards. The gale took us by her like we was racin', 'n' the boys had to work like Sam Patch to get back. I guess it took nigh half 'n hour to creep up to wind'ard of her again.

"One o' my crew, a young fellow from Maine, as lively a little grig as ever I see, volunteered to board her. We ran under her bow, an' somehow or other he clumb up on board, I swear I

don't see how he ever done it, an' snaked a line round her funnel. I went aboard an' one other o' the crew, a man we used to call Ginger.

"Then we found out why the men aboard the steamer hadn't come out to pick up our line. The door o' the pilot-house was smothered in ice, more'n an inch thick. Every window was friz in. We was sure up against it. We couldn't stand on the glassy deck, 'n' there was no way to get the men out. The surf-boat was a-ridin' twenty fathom behind, we'd let her out on a long line, an' there was another cold wait while we hauled her up an' got an ax out of her. We lashed ourselves fast or we'd ha' gone over the side, sure.

"When Ginger, who was an old lumber-jack, gits the ax, he slides along to the pilot-house, an' starts to chop. He'd been choppin' jest about a minute when along comes a sea, smashes one o' the ventilators an' hurls it along the deck. The cussed thing hits Ginger jest as he's swingin' the ax, 'n' sweeps him overboard.

"The crew in the surf-boat see him go an' they cast off the line an' picked him up. But, with two men shy, it was a full hour afore the boat worked back to place to catch our line. They must ha' pulled like fiends to git thar at all. By the

time they'd made it, we'd managed to get through that door an' the crew o' the tug was ready to be taken in the boat. It was jest six hours from the time we landed on the beach at Chocolay before we got the first man ashore."

"And the crew of the schooner?" queried the boy.

"We got them off without no trouble. They was sailors! We jest hove a line aboard 'n' got 'em into the boat. They hadn't suffered much. The schooner was higher on the shoal 'n the tug, bein' lighter, 'n' the men'd been able to stay below. They'd kep' a couple o' lookouts on the job, relievin' 'em every hour shipshape and Bristol fashion."

"How many men did you rescue?" the boy asked.

"Nine men from the steamer 'n' six from the schooner. It was nigh eight in the mornin' before they was all ashore, drinkin' coffee an' gittin' eats. The women o' the commoonity was still on the job. I'm doubtin' if we could ha' ever made it without somethin' like that. We wa'n't any too soon, neither."

"Why not?"

"In less 'n an hour after we got 'em ashore the

tug capsized 'n' went to pieces. The old schooner stood it out better, but she was pretty much a wreck, too, when the weather cleared. We'd our work to do, 'n' we done it. Jest the same, I've allers had a feelin' as if there was as much to be said for the fishermen, 'n' the train-hands, 'n' the cap'n o' the tug, 'n' all the rest that j'ined in.

"It's the biggest rescue on the lakes, but there's nothin' more wonderful in it to me than the way it shows how everybody gets in 'n' gives a hand when help is needed. Don't ye ever forget, in times o' need, that ye've only got ter call, 'n' some one's goin' to hear. An' ye're like enough ter need help in the life-savin' business. I ain't saying as storms is as bad now as they was, but there's enough of 'em still ter keep any crew right on the jump."

"I'll remember, Mr. Icchia," the boy replied, "and I'll be mighty proud if I can ever do half as well. I'm proud enough, now, just to be given the chance."

The old man knocked the ashes from his pipe on his horny and weather-beaten hand and answered,

"As long as there's life-savin' to be done, there's goin' ter be life-savers to do it. I don'

Courtesy of U.S. Coast Guard.

GOLD LIFE-SAVING MEDAL.

Given only in recognition of heroism wherein loss of life was risked by the rescuer.

hold with none o' this nonsense ye hear sometimes about the world gittin' worse. If ever I did get that idee, I'd only have to go 'n' look at a surf-boat, 'n' I'd know different. It's a good world, boy, 'n' the goodness don't lay in tryin' to be a hero, but jest in plain bein' a man."

CHAPTER V

SAVED BY THE BREECHES-BUOY

The last words of the old keeper, "Goodness don't lay in tryin' to be a hero, but jest in plain bein' a man," rang through Eric's mind, many and many a day after, when, on his own Coast Guard station, he had to face some difficulty. His post chanced to be in a somewhat sheltered spot, and thus gave him an opportunity to become a good oarsman. His work with the volunteer corps had made him a first-class swimmer and a fair boatman. The government service, however, he found to be a very different matter. There, efficiency had to be carried to the highest degree.

He snatched every opportunity, too, to get ahead with his studies, and luck came his way in a most unexpected shape. It happened that quite near the Coast Guard station was the hut of a queer old hermit sort of fellow, called "Dan." He had been a life-saver many years before, but in a daring rescue had injured his back, and could never enter a boat again. In those days there were no

pensions, so for forty years and more he had made a living by inventing riddles and puzzles, tricks of various kinds, and clever Christmas toys. His especial hobby was mathematical puzzles. He used to drop into the station quite frequently, for he was very popular with the men.

"Dan," said Eric to him one day, "I don't see how you can be so interested in that stuff. It's the bane of my life. I'm nailing as hard as I can to try and get in shape for a Coast Guard exam., and I simply can't get hold of the mathematics end of it."

"Why for not?"

"Don't know enough, I guess," the boy answered. "I'm right up on everything but mathematics, but that gets me every time. I know there's some sense in it, but I can't see it. Everything else I've got to study I can find some interest in, but mathematics is as dull as ditch-water. How you can find any fun in it, I can't see!"

This was like telling a painter that color had no emotion, or a scientist that science had no reasonableness. The old puzzle-maker gasped.

"No fun!" he exclaimed. "It is the mos' fun in the world. I show you!"

Pulling from his pocket a pencil and an old en-

velope he drew a baseball diamond, and marked the positions of the players. Eric's interest arose at once, for he was a keen baseball fan. As the sketch grew the old man talked, describing a queer entanglement of play.

"Now!" said the old man, "what shall he do?"

The boy, judging from his knowledge of the game, made a suggestion, which the other negatived. As soon as the boy made a guess, the other showed him to be wrong. Eric, really interested in the baseball problem, cudgelled his brains, but could find no way out.

"I show you!" the old man repeated.

Using a very simple rule of algebra, which the boy knew quite well, but giving an application he never would have thought of, Dan brought the solution in a second. Hardly believing that mere mathematics could be of any service in a baseball game, Eric tested the result. It was exactly as the old man had said.

"Gee," he said, "that's great!"

The puzzle-maker smiled, and showed him how mass-play in football was a matter of science, not strength, and how lacrosse was a question of trajectory.

"Not only in games," he said. "'Rithmetic, geometry—in everything. You know Muldoon."

"Sure I know Muldoon," the boy said.

"Have you seen him shoot?"

"With the Lyle gun, you mean? Isn't he a dandy at it?"

"That is what I would say," the old man continued. "How does he fire him?"

"Why, he just fires it! No," he corrected himself, "he doesn't either. I see what you're driving at. That's right, I did see him doing some figuring the other day."

"I teach Muldoon," said the old man. "I show him how to tell how much wind, how to tell how far away a ship, how to tell when a line is heavy or light. He figure everything, then fire. Bang! And the line to bring the drowning men home falls right over the ship. It is?"

"It is, all right," the boy agreed. "Muldoon gets there every time. I always thought he just aimed the gun, sort of naturally."

"It is all mathematics," said the old man. "You have guns in the Coast Guard?"

"Rapid-fire six-pounders," the boy answered. "At least I know that's what the *Itasca's* got.

She's the practice-ship at New London, you know."

"Do you have to learn gunnery?"

"Rather," said the lad. "Every breed of gunnery that there is. You know a Coast Guard cutter becomes a part of the navy in time of war, so an officer has got to know just as much about big guns as an officer in the navy. He might have to take his rank on a big battleship if the United States was at war. You bet I'll have to learn gunnery. That ought to be heaps of fun."

"But gunnery is ballistics," the old man said. "And ballistics is trigonometry. Big gun is fired by figuring, not by looking."

"I'm only afraid," the lad replied, "that I'll never have a chance at the big gun. Everywhere I go, it's nothing but figuring. And I simply can't get figures into my head."

"You really want to learn?"

"You bet I do," said Eric. "I'm working like a tinker at the stuff every chance I get, but I don't seem to get the hang of it somehow."

"If you come to me, I teach you."

"Teach me all I want to know?" said the boy in amazement.

The old man shook his head.

"Teach you to want to know all you have to know. Teach you to like figures."

Eric looked at him a minute.

"All right, Dan," he said, "I'll go you. I've still got some of the money I saved up from my work this summer and I was going to spend part of it on tutoring this winter, anyway. I'll tutor under you, whenever I'm off duty, and if you can teach me to like figures, you're a good one. Any way, your cottage is so near that I can get right on the job if the station calls."

True to his word, a few days later Eric appeared at the tiny little cottage—it was scarcely more than a hut—which was the home of the eccentric old puzzle-maker. The top part of it was a home-made observatory, and the whole building looked a good deal like a large beehive.

"String in the corner," said the old man, after welcoming him. "Get him."

"It's all knotted, Dan," the boy replied, holding up a piece of rope with a couple of dozen strings hanging from it, of various colors, all intertwined.

"Of course he is," the old man replied. "Read him."

"What?" asked the boy.

"Read him," repeated the old man.

"What does it mean?"

"He's what Incas used to count treasure with," the old man said. "He's quipu, a copy of one Cortez found in City of Sun. You like to read what he says?"

"You bet I would."

"Bring him here."

Wondering a good deal at the odd puzzle-maker's manner, for the lad had gone to the cottage in good faith with his books, expecting to work on the problems that were disturbing him, he brought over the knotted quipu.

"Green string means corn," said the puzzle-maker, "because he's the color of growing corn. What you suppose white is?"

"Silver," guessed the boy.

"Right. And yellow?"

"Gold."

"Right, too. And red?"

"Copper?" hazarded the boy.

"Not bad guess," the old man said. "Not copper color, red."

"Red stands for war," said Eric meditatively, then, with an inspiration, "in those days a coun-

try was rich if it had soldiers. Does the red mean soldiers, Dan? "

"Soldiers, right," the old man answered. "The Quipucamayocuna—"

"The what, Dan? "

"Knot officers," explained the other, "kept track of him all. They counted tens, single knot meant ten; double knot, hundred. Now read him. Cross-knotting is for groups."

Eric worked for a quarter of an hour and then looked up.

"I've got it," he said.

"What is he? "

"In this town," said the boy, "there were seven regiments of soldiers, I've got down the exact number of men in each regiment. Some had plenty of food in the regimental storehouse, some had only a little. But—if I get it right—there was money belonging to each regiment in a treasure-house, somewhere, like a bank. I suppose they could exchange this for food. And, if I've read it right, there was one regiment which had money but no men. I suppose they were wiped out in battle."

"Very good," answered the puzzle-maker, look-

ing pleased. "You keep accounts, your own money?"

"Of course," answered the boy, pulling out a little diary from his pocket.

"Here, string," said the old man. "Write your week's accounts in quipu."

Thoroughly interested, Eric took up a pile of colored strings, from the corner and started to convert his week's accounting into quipu. He worked for half an hour, but couldn't make it come out right. It proved an exasperating puzzle, because it seemed impossible and yet conveyed the suggestion that there ought to be some way of doing it. Already Eric had so keen a sense of the old man's comments that he hated to say that he couldn't do it. But, after a while, red in the face and quite ashamed, he said,

"I can't do it, Dan."

"No, he is not possible," said the puzzle-maker cheerfully. "That's what I wanted you to find. The quipu is wonderful but he's not wonderful enough, eh?"

"We'd have trouble trying to handle a big modern banking business by it, all right," the boy agreed. "But, Dan, how about this studying I'm supposed to do?"

"You know Latin numerals?" the old man replied.

"Of course!" Eric answered indignantly. "I couldn't even tell the time if I didn't!"

"Write 'Four,'" came the order.

Promptly the boy wrote "IV."

"Now look at watch."

"It's got four ones there," Eric said ruefully.

"The 'IV' form is late," said the puzzle-maker. "I show you something. Copy column of pocket cash-book in Roman numerals, then, without thinking in figures, add up column."

Not in the least understanding what were the old man's ideas the boy did as he was told. It was easy enough to write down the numbers, but when he came to add them up, he found himself thinking of Arabic figures in spite of himself.

"I'm cheating," said Eric suddenly, "I can't help adding up in the old way."

"Good boy," said the puzzle-maker. "I knew that. I show you some more. Simple addition. Write in Roman numerals one billion, seven hundred and forty-two million, nine hundred and eighty-three thousand, four hundred and twenty-seven and eleven-sixteenths."

Although pretty well posted, Eric had a hard

time writing down the number and had to ask a lot of questions before he could even write it correctly. Then the puzzle-maker gave him half a dozen figures of the same kind. It looked weird on paper.

"Now add him up," the old man charged him.

The boy started bravely. But he hadn't gone very far before he got absolutely stuck. He wrestled with that sum of simple addition for nearly an hour. At last he got a result which seemed right.

"Put him down in ordinary figures," came the order. "Add him up."

Eric did so, having his own difficulties in re-transcribing from the Roman numerals.

"Are they the same?"

"No," the boy said, "I got the other wrong somewhere."

"S'posin' you had him right," the puzzle-maker said, "it took you hour. Ordinary figures you did him in thirty-two seconds."

"I see," said Eric, "it's another case of wonderful but not wonderful enough, isn't it?"

"Exactly. Here," the other continued, reaching down a manuscript portfolio, "is every kind of numbers ever made. You find that the

Hindu—or wrongly called Arabic—numerals are the only ones wonderful enough for modern uses."

Thoroughly interested, the boy sat down with this big manuscript book. Weird schemes of numeration rioted over the pages, from the Zuni finger and the Chinese knuckle systems to the latest groups of symbols, used in modern higher mathematics, of which the boy had not even heard. It was noon before he realized with a start that the morning was gone.

"Oh, Dan!" he said reproachfully, "we haven't done anything to-day."

"Never mind," said the old man, "we get a start after a while."

That afternoon, when the boy settled down to do some work on his own account, he felt a much greater friendliness to the mere look of figures. They seemed like old friends. Before, a figure had only been something in a "sum," but now he felt that each one had a long history of its own. Little did he realize that the biggest step of his mathematics was accomplished. Never again would he be able to look at a page of figures with revulsion. They had come to live for him.

The next morning, Eric found the old puzzle-maker busy with a chess-board.

"Aren't we going to do any work to-day, either?" he asked, disappointedly.

"Soon as I finish," the old man answered. "Get pencil and paper. As I move knight from square to square, you draw."

Shrugging his shoulders slightly, but not so noticeably that the puzzle-maker could see, Eric obeyed. It seemed very silly to him. But as the knight went from square to square in the peculiar move which belongs to that piece in chess, the boy was amazed to find a wonderful and fascinating geometrical design growing under his hand.

"Another way, too," said the old man thoughtfully, the instant the figure was finished, not giving the boy a chance to make any comment. And, without further preface he started again. This time an even stranger but equally perfect design was formed.

"But that's great!" said Eric, "how do you know it's going to come out like that! I wonder if I could do it?"

"Try him," the puzzle-maker answered, getting up from the board. For half an hour Eric moved the knight about, but never got as perfect an example as the old man.

"Are there only those two ways?" said the boy at last.

"Over thirty-one million ways of moving the knight so that he occupies each square once," was the reply. "Every one makes a different design."

"I'll try some this evening," said the boy. "But it's funny, too. Why does it always make a regular design?"

"You want to know? Very well." And the puzzle-maker quietly explained some of the most famous mathematical problems of all time, working them out with the chessmen and the board.

"You know what they call him, magic?" queried the old man.

"Magic! No!" exclaimed Eric pricking up his ears at the word. "Tell me about it, Dan."

"Numbers all friends, live together, work together," the puzzle-maker answered. "I show you." And, taking pencil and paper, he dotted down in forms of squares and cubes rows and rows of figures. "Add him up," he said, "up and down, cross-wise, any way. He all make same number."

"They do, sure enough," said Eric, after test-

ing half a dozen magic squares, "but how do you do it? Do you have to remember all those figures and just where they go?"

"Don't remember any of him," the other answered. "He has to go so."

"But I can't make them come that way," exclaimed the boy, after trying for a few minutes. "What's the trick?"

"All friends," repeated the old man, and in his curiously jolting speech he told Eric the startling links that are found in the powers of numbers. As soon as he had the principle clearly in mind, the boy found that there was no great difficulty in making up the most astonishing magic squares.

As the winter drew on, and calls for help on the stormy waters increased, the opportunities for sessions with the shrewd old mathematician grew fewer, but Eric stuck fast to his promise to spend all the time he could afford with his instructor. He was keenly disappointed that the puzzle-maker showed such an absolute disregard of the actual things the boy wanted to prepare for in his examinations. But Eric had been rigidly trained by his father in the sportsmanlike attitude of never complaining about any arrangement he had made him-

self, and he paid for his coaching out of his small earnings without a word. In order to make up for what he inwardly felt was lost time, he worked by himself at his books in such few minutes as he was able to snatch from his life-saving duties. And, although he was tired almost to exhaustion, many and many a day, he found that even in that work he was getting along quite well.

Eric could never get his eccentric teacher to look at the books required in his preparatory work. What was more, he had a feeling that he couldn't really be getting much good from his hours spent with Dan, because he enjoyed them so much. Early schooldays had made him associate progress with discomfort.

For example, one day Dan showed him tricks with cards—and then explained the mathematics of it, making the most puzzling mysteries seem only unusual applications of very simple principles. Another day, the puzzle-maker told him of curious problems of chance, by dice, by lotteries, and so forth, and almost before Eric realized what the old man was driving at, the essential ideas of insurance and actuary work were firmly fixed in his mind.

It was not until a couple of weeks before the ex-

pected close of navigation that the puzzle-maker said,

"Let me see book!"

Astonished at the now unexpected request, Eric handed him the much bethumbed volume over which he had struggled so hard. The old man skimmed through its pages, nodding his head from time to time and mumbling in a satisfied way. Then, like a man driving in a nail, he pounded Eric with question after question. He seemed to be asking them from the book, but Eric knew that none of the problems had their origin in it, for they dealt with the work he had been doing in the little cottage by the sea. Yet to almost every one the boy returned a correct answer, or at least, one which was correct in its approach. For two long hours the puzzle-maker questioned him, without ever a minute's let up. At the end of it, Eric was as limp as a rag. At last the old man laid down the book.

"When your examination is?" he asked.

"Next June," the boy replied.

"You can pass him now."

Eric stared at the old man with wild surprise in his gaze and with a down-dropped jaw.

"But I haven't even started on the second half

of the book," he said. "And I've got to do it all!"

"You pass him now," was the quiet answer. "The second part—you have done him, too. Learn rules, if you like. No matter. You know him. See!"

He showed the very last set of examples in the book and Eric recognized problems of the kind he had been doing, all unwitting to himself.

"Mathematics not to learn," he said, "he is to think. You now can think. To know a rule, to do sum—bah! he is nothing! To know why a rule and because a sum—he is much. You do him."

In the few remaining visits that Eric paid the puzzle-maker, he found the old man's words to be quite true. Having learned the inside of mathematics, its actual workings seemed reasonable. The clew gave Eric the sense of exploring a new world of thought instead of being lost in a tangled wilderness.

Meantime, he had become absolutely expert in every detail of the station. His particular delight was the capsize drill. The keeper had got the crew trained down to complete the whole performance within fifty seconds from the time he gave the order. The boat had to be capsized,

every man underneath the boat. Then they had to clamber on the upturned boat, right it again, and be seated on the thwarts with oars ready to pull before the fiftieth second was past. It was quick work, and although only a drill, was as exciting as the lad could wish. Two or three times, one of the men, who wasn't quite as quick as the rest, got " waterlogged " and the crew had to help him up. When that occurred, there was an awful howl.

Once, only once, Eric delayed the drill about two seconds and it was weeks before he overcame his sense of shame at the occurrence. But, before the winter finally closed down, Eric was as able a coast-guardsman as any on the Great Lakes. It was well that he was, for a day was coming which would test his fortitude to the full.

Navigation had been lessening rapidly, and the boy was beginning to think about Thanksgiving Day. They were just sitting down to supper, when one of the men came in with haste.

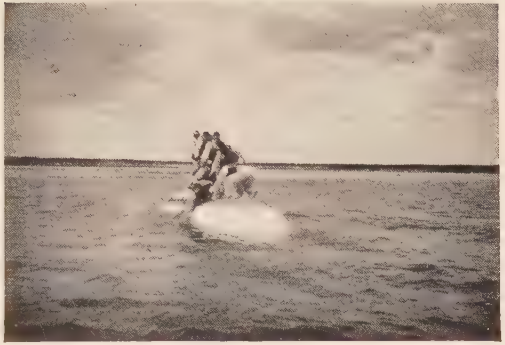
" Heard anything of a wreck round Au Sable way? " he asked breathlessly.

" No," said the keeper, " what did you hear? "

" Nothin' definite," said the other, " but as I was comin' along a chap stopped me and asked

Fifth Second.

Twelfth Second.



Twenty-third Second

Fiftieth Second.

Courtesy of U.S. Coast Guard

LIFE-BOAT CAPSIZE-DRILL.

me if I were goin' out to the wreck off Au Sable. He said he really didn't know anything about it, except there was a report that the *City of Nipigon* was on the rocks near Grand Point."

The keeper jumped up and went to the telephone.

"Anything doing?" he asked, when the Au Sable operator got on the wire.

The chat in the station stopped to hear what the reply might be. Au Sable was the most exposed point on the coast and there was a gale beating in from the northwest.

"You'll let us know, then," said the keeper, and hung up the receiver. "Says he's heard something about a wreck, but nothin' definite," he added, turning to the crew. "Says a boy ran in with the news, but the kid was too excited to give much information."

"Think there's anything in it?" queried one of the men.

"Hope not," said another, "I was out that way day before yesterday an' there's an ice wall there about twenty feet high. I don't know how we'd ever get a boat over it."

"We'd get it over, all right."

"How?" asked Eric interestedly.

"Aeroplane, if necessary," said the keeper laughing.

"No, but really," the boy protested.

"Brute strength and luck, I guess," the other said, "but I'm hopin' that we don't have to go out to-night."

"Me too," added the boy. "I've got some 'trig' "—

The telephone bell rang.

"That's it, likely enough," said one of the men, getting up resignedly and going over to the locker for his oilskins.

"Well," said the keeper, as he took off the receiver. Then, a minute later turning to the men, he repeated to the crew, "'Steamer, *City of Nipigon,* seven men aboard, burnin' distress signals, on rocks north and by west of Au Sable light, quarter of a mile from land.' Right you are, boys, we're off!"

There was a transformation scene. When the keeper began the sentence, the Coast Guard station had been a scene of peace and comfort with a group of men lounging around a hot fire, some reading, some playing dominoes and others plying needle and thread. But, before the sentence was over, almost every man was in his oilskins, some

were just pulling on their long boots, while others, even more nimble, had reached the boat and the apparatus-cart. They were standing by for orders when the keeper joined them.

"She's less'n a quarter of a mile out, boys," he said. "I reckon we'd better try an' get her with the gun. After, if that doesn't work, we can get the boat. But if we can put a line across her right away, it'll be safer an' quicker. I don't fancy handling the boat down any such ice as Jefferson talked about."

The apparatus-cart was out of the shed and started almost before the keeper had finished his orders. Eric, who was no mean athlete, was glad of every ounce of strength he possessed before he had gone a hundred yards. The cart, fully loaded, weighed 1120 pounds and there were seven men to drag it, a fairly good load on decent ground. But the ground was all of eight inches deep in new-fallen snow into which the wheels sank. The on-shore wind was dead against them, swirling like a blizzard. The temperature was only about five degrees below zero, but there was an icy tang that cut like a jagged knife.

In spite of the intense cold, so laborious was the dragging of that cart through the snow, that Eric

broke out in a violent perspiration. What troubled him still more was the realization that he was already tiring, although the party was still on the beaten road. In a very short while, he knew, they would have to strike off from the track, across wild and unbroken country to the beach.

To his surprise, the keeper kept right on, leaving the light on the left hand. The boy, forgetting discipline in his eagerness and excitement, spoke out,

"I thought they said 'west' of the light!"

The keeper turned and looked. He spoke not a word. There was no need.

Eric colored to the roots of his hair. He felt the rebuke.

Finally when they had passed the light by nearly half a mile, the road went up a slight hill, and the keeper led the way at right angles along a ridge of rock. It was rough almost beyond believing, but its very barrenness had made it useful. As the keeper had shrewdly hoped, the swirling blizzard had left its rough length bare, when all the lower ground was deep in snow. For the hundredth time since he had been on the station, Eric had to admit the wise foreknowledge of his chief.

As they swung on to the ridge the keeper turned and looked at Eric again. He caught the boy's apologetic glance and smiled back. No word was passed, but both understood.

The ridge helped them gallantly, though the wind whistled over it as though it were the roof-pole of the world. More than once it seemed to Eric as though the apparatus-cart would be turned upside down by some of the terrific gusts, and the boy had a mental picture of the crew floundering in the snow-drifts beneath.

Near the lighthouse, the ridge that had so befriended them merged into the level, and the crew forced its way on through ever deepening drifts. For about fifty yards the snow was above the hubs of the wheels, and more than once it seemed that the apparatus cart was so deeply stuck as to be immovable. The men left the shafts, and crowding round the cart like ants they forced it free, and half carried and half pushed it through the snow.

"Is there any shnow left at all?" queried Muldoon, when the worst of this was overpassed.

"What do you mean?" one of the men asked.

"I thought we'd waded through all the shnow in the worrld," the Irishman replied.

For a little space it was easy going until they came to the dunes above the beach. There the crew halted. As Jefferson had said, sloping upwards at an angle of forty degrees, was a steep sheet of glare ice, almost as smooth as though it had been planed. It would have taken a fly to walk on that surface, yet on the farther side of it was the only road to the wreck. The light was on the end of a little spit and the vessel in distress could be seen only from this spit. Without going on that neck of land she could not be reached by the gun, and this passage was grimly guarded by that sloping embattlement of ice.

"Up it, lads!" said the keeper.

The crew, gathered around the apparatus-cart, started up the slope. Six feet was as far as they could get. Even without added weight no one could stand on that glistening surface, and with the drag of the cart it was impossible. Several times the men tried it, only to come sprawling in a heap at the bottom of the hill.

"Two of you get up to the top!" ordered the keeper.

Two of the lightest men started. One of them, picking his steps with great care, managed to get half-way up; the other, going back for a run, tried

to take the hill with a tremendous spurt. His impetus took him almost up to the top, but he was a few feet short and slipped back. He returned for another attempt.

In the meantime Eric had an idea. Instead of attacking the cliff at the point the others were trying, and where it was shallowest, he went twenty yards farther west, where the cliff was steeper, but rougher. Taking an ax he started to cut niches for steps up the cliff. He knew it would take a long time, but if the others did not succeed before him, he would at least get there. If the others succeeded, the loss of his time did not matter.

So, steadily, inch by inch, foot by foot, he made his way up the cliff, taking the time to make the notches deep enough for surety. The ice was not extremely hard, and Eric soon won his way to the top. He found the edge exceedingly difficult to walk on and very dangerous, for it fell in an almost sheer precipice on the water side, with the mush-ice beating up against it. The top, too, was soft and honeycombed. Using as much care in going along the edge as he had in scaling it, the boy soon found himself on the cliff immediately above the cart.

"Here, you fellows," he called, "heave me up a line!"

There was a second's surprise when the other members of the crew saw Eric on the crest of the ice-barrier which so far had defied them all.

"Good work!" called the keeper. "Jefferson, toss up the line."

Eric caught it.

"Have you a spike or anything?" he called, "I'll haul it up!"

The keeper yanked out one of the spikes of the frame on which the line was faked and the boy carefully hauled it up, then drove it into the ice as hard as he could, using his heavy boot for a hammer. He next took the line, and wound it around the spike to help him in holding it.

"Now," he yelled through the storm, "some one can come up the rope."

"Muldoon," said the keeper to the Irishman, "you're about the lightest, you go up first."

"'Tis meself will do it," was the reply, "an' it's blitherin' idjits we were not to think o' the way the kid did it."

Then he shinned up the rope like a monkey on a stick.

With both Muldoon and Eric hanging to the

Courtesy of U.S. Coast Guard.

RUSHING THE APPARATUS–CART.

Coast Guard Crew with life-gun, line-box, shots, hawser, breeches-buoy and signal-lights, ploughing through heavy sand to wreck on beach a mile away.

rope, it was not long until five men got to the top. The keeper, seeing how successful Eric's plan had proved, ordered every man to cut for himself a good foothold in the ice, and then, tailing on to the rope, they got the apparatus-cart up the slope, two men behind trying to guide it from below. It was a difficult haul, but at last they got the cart to the summit, and, in order to keep it from sliding down, straddled the wheels atop.

The cart rocked unsteadily. Suddenly, as a particularly vicious blast came whistling by, it canted as though it were going to fall. Eric, who was a few feet away from the cart, jumped forward to save it, but missed his footing and fell into the mush-ice twenty feet below, going clear through.

There was no time for orders. Muldoon, quick as a wink, almost before any one else had grasped the accident, knotted a line around the cart and taking the other end in his hand jumped into the mush-ice after the boy. So true was his eye that he struck almost the same point and a few seconds later appeared above the surface with Eric. Neither was hurt, but both were wet through, handicapping them for work on so cold a night.

Eric's ruse in getting the apparatus-cart to the top of the cliff, however, had solved the biggest part of the difficulty. By carefully sliding the cart along the face of the cliff for ten yards or a little more, they found themselves above the road leading out to the spit. It was then merely a matter of lowering the cart to the other side.

Meantime Muldoon had raced the boy to the lighthouse for a chance to change their clothes before they froze on them. No sooner did he knock on the door than the lighthouse-keeper came out, and the open door showed his daughter behind. Edith Abend was only seventeen years old, but she had already saved two lives.

"You got here at last, then," said the lighthouse-keeper gruffly.

Edith, with a readier sense that help was needed, said quickly,

"What has happened? Is there anything wrong?"

"Nothin' wrong at all, darlint," said the Irishman, with his national readiness to say nice things to a pretty girl, "only we've had a trifle of a duckin' an' if there's annything like dhry clothes in this house it would help us to our work. The lad here's quite wet."

"I don't see that I'm any wetter than you are!" protested Eric.

The light-keeper looked them over.

"Yon's the crew?" he asked.

"Yes," said Eric, "we've had a hard time getting here."

"I was wonderin' how ye were goin' to get over the ice-wall."

"We got over, all right," the boy replied.

"I see ye did. Well, I reckon I've some old things ye can have," the keeper said grouchily.

The girl disappeared and a moment later came back into the room.

"They're all in there," she said simply, pointing to the next room.

"'Tis yourself that's the jewel," Muldoon said, leading the way in with alacrity. There was nothing the matter with the Irishman's movements. When he wanted to be quick he could move like a streak of extra-greased lightning. He was out of his wet clothes and into a complete set of the keeper's in a hurry. Eric was not many seconds behind. They put on their own slickers, which had been dripping at the fireside, and were ready for work again.

Great was the boy's surprise, as he tied on his

sou'wester, to see a small figure covered from head to foot in oilskins waiting for them. Still greater was his amazement when he saw that this was the girl.

"Is it comin' out to watch us ye are, Miss?" said Muldoon. "Sure the wind will blow ye away entirely. It's admiring the pluck of ye I am, but ye'd better stay indoors. 'Tis no night to be watchin'."

"I'm not going to watch, I'm going to work," the girl said calmly. "And I don't think you ought to waste time talking, either."

So saying, she walked out of the door to avoid further argument. The light-keeper looked longingly after the three as though he would like to join them, and help in the rescue, but his duty was with his light and he could not leave it.

So quickly had all this passed that Muldoon, Eric and the girl got to the edge of the spit just as the five members of the Coast Guard crew had unshipped the gun, placed it in position and loaded it.

"That you, Muldoon?" said the keeper.

"Yis, sorr, it's me."

"You'd better take the gun. You're the best

shot. That is, if you're all right after your ducking."

"I'm in warrm, dhry clothes," the Irishman answered, "an' I'll do as you say. But you're just as good a shot yourself," he added.

"Don't blatherskite," the keeper said. "Grab hold an' lay her straight."

The Lyle gun, being so short, gives little real opportunity for aim, and the best man is one who has an intuition. This, Muldoon had. Besides, the old puzzle-maker had taught him how to allow for the drop of the line and how to estimate the force of the wind.

He fussed around for a minute or two, saw that the line was free on the pins and that the case was free, and waited for the gusts of wind to die down to a steadier gait. Then he fired. The red flare of the short cannon showed clear against the ice and the line went sailing out gracefully.

"Too far for'ard," said Eric disappointedly, as he saw it start. Muldoon only shook his head.

"'Tis not far off," he said.

Sure enough, as the missile was about half-way out to the wreck, the wind took the line and drove it sideways till it fell right abaft the funnel. A

flare from the steamer showed that the line had been received.

"Nice shooting, Muldoon," the keeper said. "We'll have to give the credit to that well-fittin' coat you've got on." The lighthouse-keeper was at least twice the Irishman's size.

Muldoon looked particularly proud, because he had wanted to distinguish himself before the girl. It was of vital urgency, moreover, for if Muldoon had not been able to land the line, it would have meant a trip back to the Coast Guard station to get out the surf-boat, with very little likelihood of being able to force her up against the gale.

The men on the steamer started to haul in and the life-savers bent on a larger rope with a block and tackle. Again the steamer burned a flare to show that the block had been hauled on board and securely fastened, and then the coastguardsmen began to haul on the line, pulling out to the ship a heavy hawser on which ran the carriage for the breeches-buoy. Everything worked without a hitch, the hawser was got on board and the breeches-buoy hauled out.

Then the trouble began. The steamer lay partly submerged. She was a small boat and her only mast had gone by the board. The bridge was

a tangle of wreckage. The breeches-buoy, therefore, could only be made fast to the stump of the mast a few feet above the deck. Ashore, the same difficulty prevailed. There was no high land, the tripod being down almost on water-line. As soon as the hawser got wet and heavy with snow and the ice from the blowing spray, it began to sag so that it nearly touched the water.

With the weight of a man on it, the breeches-buoy line sank below the surface of the water, or rather the mush-ice. It was bad enough for the rescued men, already nearly perishing with exhaustion, to have to get a ducking, but there was still a greater danger. This was that the tackle might not stand the strain of dragging the breeches-buoy, with a man in it, through the mush-ice. The increased resistance might break the line and risk anew the perishing of every life on board.

The keeper saw the difficulty and decided promptly.

"Jefferson and Harris," he shouted, "you're the tallest. Get out into that mush-ice and see how deep it is. Wade out as far as you can go. Follow the line and stand ready to catch the breeches-buoy."

The two men chosen waded out, battling almost for their lives with big pieces of ice. Fortunately the bottom sloped gradually and they were able to walk out a considerable distance. Shouting to them through his trumpet to wait there, the keeper ordered the rest of the crew to haul in the first man. As the keeper had expected, the rope sagged terribly, but, by drawing up his legs, the rescued man did not actually sink into the mush-ice until nearly up to the spot where Jefferson and Harris stood. The two men grasped the buoy and started pulling it ashore, one man holding the survivor's head above the water and ice, while the other made a path in the ice by forcing his way ahead of the buoy.

Half-way in, Harris collapsed. It afterwards developed that he had been quite badly hurt on the ice-barrier but had not said a word about it. As four men were needed on shore and there should be three to help in the ice, the crew was a man short.

"I wish we had a third man!" said the keeper irritably. "Confoundedly annoying that Harris should have got hurt now."

"You have a third," said a quiet voice, and Edith Abend stepped forward.

"But, Miss!"

"Your orders, keeper?" the girl put in quietly.

The keeper looked at her sharply. He was a man of judgment and accustomed to read faces. Without another word, and in the tone he would have used in speaking to another man he said,

"Get right out there and hold the man's head above water as he comes in. Jefferson and you, Eric, will break the way for the buoy."

And so it was, that with a light-keeper's daughter, a girl seventeen years old, as the seventh in the crew, the life-savers of Point Au Sable saved from the *City of Nipigon* every soul on board.

CHAPTER VI

A BLAZON OF FLAME AT SEA

THREE weeks after the rescue of the crew of the *City of Nipigon,* navigation on Lake Superior closed down for the winter. Although the work had been hard and, during the last month, quite exhausting, Eric felt keen regrets in leaving the station and in bidding good-by to Dan. He had become quite attached to the old puzzle-maker and had grown to realize how valuable his help had been.

Eric found, moreover, that not only had the hermit mathematician started him along the right road to algebra, to "trig." and even toward the geometry which he once hated, but also that his training with the old puzzle-maker had taught him how to study. He settled down in deadly earnest in Detroit, keeping up with all his special studies and also doing a good deal of hard reading with his father's help. The inspector knew that the entrance examination to the Coast Guard Academy was one of the stiffest tests in the gov-

ernment service and he willingly gave his time to help Eric. It was a winter of hard work and, aside from some skating and ice-hockey, Eric took little time off from his books.

Largely as a result of the puzzle-maker's guidance and by his own persistent digging, Eric was well prepared for the examinations in June. He had some difficulty with rules and forms, but the essential principles of things were fixed solidly in his mind, so that when the lists were published, Eric found his name third, and second in Mathematics. His rival was a young fellow, named Homer Tierre, from Webb Academy, who was entering as a cadet engineer. The two boys struck up a friendship outside the examination room, and Eric was delighted to find that his new acquaintance had passed, with him, so high in the list that the acceptance of both was sure.

Although, at the Academy, Homer and Eric were apart a good deal, the one being a cadet of engineers and the other a cadet of the line, still they had many classes together. Eric, accustomed to the life-saving work, was able to be a good deal of help to his friend and taught him many tricks of swimming that he had learned from the Eel, two years before. Moreover, hav-

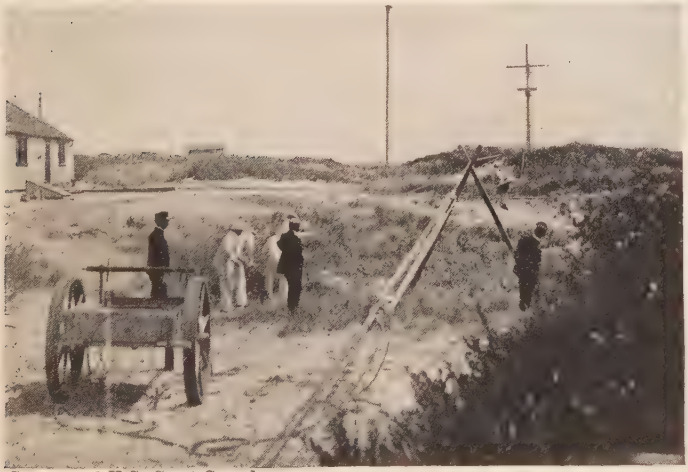
ing been used to the strict discipline of the old lighthouse inspector at home, Eric fell readily into the rigid rules of the Academy and often was able to save his friend from some pickle for which the latter was headed. Homer's assistance was equally valuable to Eric, for the young cadet engineer had been daft about machinery ever since he was old enough to bang a watch to pieces to find out what made it go, and he was able to instill into Eric some of his own enthusiasm. This friendship was an added joy to Eric's delight in the Academy. He had never been more happy than during his first year as a cadet.

Eric was fortunate in having the right angle to life on entering the Academy, so that he did not have any difficulty in understanding the character of the discipline. A number of his classmates, conscious that they were training for commissions, considered themselves as junior officers. They were quickly set right on this mistaken idea, but the process of disabusing some of them was a sharp one. One member of the class, in particular, had the notion that the Academy was a matter of books, smart uniforms, and a preparation for epaulets. When he found that he had to drill as a

Courtesy of U.S. Coast Guard.

BREECHES-BUOY DRILL.

Firing Lyle gun in corner; shot seen carrying line to mast to right of flagpole; rest of crew preparing to erect tripod.



Courtesy of U.S. Coast Guard.

BREECHES-BUOY DRILL. RESCUING SURVIVORS.

Line has been carried to mast, and made fast; hawser pulled out; shore end carried over tripod; third line run out with block carrying breeches-buoy line; crew is seen hauling on line which brings in the survivor.

private, toil as a member of a gun crew, handle heavy work, use his delicate fingers in knotting and splicing and so forth, he entered a mild protest. He was set right by a homely rebuke from one of the instructors, an old sea-dog who knew everything about seamanship from the log of Noah's Ark to the rigging of a modern sea-plane.

"You, Mr. Van Sluyd," he said bluntly, "if you haven't the nerve to do an enlisted man's work, nor the brains to do it better'n he can, what use'll you be as an officer?"

To do Van Sluyd justice, however, he took the call-down in good part and knuckled to at the practical end of his training. Eric soon found that this rather drastic phrase was a very fair presentation of the point of view of the Academy. The several instructors absolutely demanded a greater efficiency from the cadets than from the enlisted men. They had to receive instruction from the non-commissioned officers, just like the men did. This was no joke, either, for a warrant officer in the Coast Guard, especially a boatswain, has a knowledge of his craft far beyond a landsman's imaginings.

"Homer," said Eric to his friend one day, after

a particularly stiff bout of gunnery mechanics, "is there anything that's ever been invented that we don't have to do here?"

"If there is, I haven't heard of it," his chum agreed. "Let's see, we've got navigation, and surveying, and physics, and chemistry, and gunnery, and tactics, and engineering, and ship-building, and—"

"Stop it, Homer," protested Eric, "you'd have to talk for a week just to make a list. I've often wondered if all this stuff is necessary."

"It sure is," his chum answered; "that's why I came into the Coast Guard instead of the Navy. There's a heap more variety, by nature of the work. A fellow's got to know everything about the handling of sailing ships, because part of the job is the handling of sailing ships in distress. He's got to be a sharp on towage, because he's got to take risks in storms that drive an ocean-going tug to port. He's got to know every breed of steamship and variety of engine, because the information's apt to be called on 'most any time."

"Yes, I suppose that's so," agreed Eric. "Navigation is just as bad. In the engineering end, you don't have as much of that, Homer, as

we do, but I tell you, it's a fright the amount of stuff we have to learn. You take an ordinary ship captain. He only has to run into a few ports, and, in any case, he never goes near dangerous shoals. All he's got to learn is to keep away from them. But there isn't an inch on the American coast from Maine to Texas or from Alaska to Southern California that we don't have to remember. Almost any day a fellow's likely to have to chase into a bad shoal to help some ship that's fast on a lee shore; and that's usually in bad weather — it's no time to guess, then, you've got to be sure."

"I sometimes doubt," said Homer, "if all this infantry drill is going to be any use."

"Oh, I can see the use of that, all right," replied Eric. "In the Spanish-American War, the Coast Guard cutters did a lot of work, and, just the other day, our men were called on to keep San Domingo in order. After all, Homer, the Coast Guard is a military arm, just as much as the navy."

"They don't worry you the way they do us," groaned the young cadet engineer, "over all the different sorts of machinery for the handling of big guns. It's thorough, all right; there isn't a chap in our class who couldn't figure out and ex-

plain every process of manufacture and mounting, up to the actual work of handling the gun in an engagement."

"I don't see that you've got any kick coming," Eric retorted, "you always said you liked machinery. Now I haven't much use for mathematics, though I don't hate it quite as much as I did, and yet we get enough coast and geodetic surveying to prepare us for exploring a new world. I suppose they figure that if the United States ever annexes Mars, a Coast Guard crew will be put in charge."

"Likely enough," said the other, "but isn't that what you like about it?"

"Sure, it's great," agreed Eric. "I'm just crazy over the Academy. I wouldn't be anywhere else in the world. I don't believe there's a college within a mile of it for real training. There's all the pep to it that a Naval School has got to have, and although they hold us down so hard, after all, we get a lot of fun out of it. And take them 'by and large,' as the shellbacks say, don't you think the Coast Guard crowd is just about the finest ever?"

"You bet," Homer answered with emphasis. "It was seeing how they handled things that first

headed me for the service. Did I ever tell you what made me want to join? ''

'' No,'' Eric replied, '' I don't think you ever did.''

'' It was in New York,'' his friend began. '' I was there with Father. We were doing the sights of the town and he took me down with him to the water-front. He took the occasion to call on the Senior Captain of the Coast Guard stationed there. They were old cronies.

'' While they were talking, there came a 'phone from the Navy Yard. On account of the Great European War the Coast Guard had undertaken some special neutrality duty in New York harbor. The Navy had lent a tug for the purpose. The 'phone message was to say that while the Coast Guard was perfectly welcome to the tug, on which the patrol was being done, the tug captain was compulsorily absent in sick bay.

'' The lieutenant, who had charge of the patrol, —he didn't look much older than I do—answered the 'phone. Evidently the admiral in command of the Brooklyn Navy Yard must have been talking to him, personally, because I heard his answer,

'' ' Certainly, Admiral. I shall be able to take her out without the master on board. As far as

that goes, sir,' he added with an earnest laugh in his voice, ' I think I could take out anything you've got, from a first-class battleship down! ' ''

'' That was going some! '' exclaimed Eric.

'' Wasn't it? But the joke of it was that the Admiral, not knowing that the Senior Captain had been in the office all the while, called him up and told him the story, ending with the statement,

'' ' I don't know that I'd be willing to say as much for all my lieutenants! '

'' ' I would! ' the Coast Guard senior captain answered. And I figured right then and there, that the Coast Guard was what I wanted.''

'' I almost feel like that lieutenant now,'' said Eric, '' and I'm not through the first year. And after the cruise I'll be Johnny-on-the-spot, for sure.''

In some ways Eric was not altogether wrong in this statement, for his thorough knowledge of mathematics stood him in good stead in navigation. Questions such as '' Great Circle Sailing '' he ate alive, and a well known problem of '' Equations of Equal Altitudes '' was, to use his own expression, nuts to him.

Eric had the sense of gratitude strongly developed, and he always kept the old puzzle-maker

informed of his progress. In return, the old man used to send him weird arithmetical problems, that it took the whole class weeks to work out.

In spite of the strong discipline, the spirit of the Academy was so congenial that the cadets were able to get into personal relations with the instructors. There was never the faintest overstepping of the most rigid rule, there was nothing remotely resembling familiarity between any cadet and an instructor, but, at the same time, the heartiest good feeling existed. For example, realizing the value of outside mathematical interests, the instructor in that subject used to allow the class to bring to him any kind of problem. On more than one occasion the instructor was as much interested in the puzzle-maker's devices as were the boys themselves. Great was the triumph of the class, when, on one occasion, they worked out a problem that had been too much for the queer old mathematician in Michigan.

The spring cruise on the practice ship *Itasca* more than fulfilled Eric's hopes. The salt of the sea was in his veins and he actually secured an approving phrase from the boatswain on one occasion—a compliment harder to get than from the Commandant of the Academy himself. It was

real hard training; the cadets had to handle the ship and do all the work aboard her, as well as to keep up with their studies. None the less, it was enjoyable, every minute of it, bad weather as well as good, and at the end of his first year's cruise, Eric realized to the full that he had chosen the career for which he was best suited.

The boy's passionate interest in his work and his doggedness in study stood him in good stead. He had not dreamed that the course would be so thorough, nor that it would require such an incessant grind, but he never let up. By the end of the second year he was regarded as one of the most promising men in his class, and he had made several substantial friendships with his classmates. The Academy had none of the "prize" incentives of many colleges. A cadet had to work for all that he was worth just to pass. There were no half-way measures. Either a cadet passed or he failed. It wasn't healthy to fail. By the end of his second year Eric was well up in his class. He had qualified as a corporal in the military drills, he had secured the coveted honor of gunner's mate, and he was even looked upon with favor by "Tattoo Tim," alias Boatswain Egan of the *Itasca.*

Eric never forgot the first day when he was allowed to con a ship. It was right at the beginning of his third cruise. He had put a gun crew through its drill, under the eye of the officer, and felt that he had acquitted himself creditably.

"Mr. Swift," said the first lieutenant to him, "put the ship's position on the chart."

Eric saluted and withdrew. A few minutes later, returning to the executive officer, he answered:

"Forty-one degrees ten minutes north; seventy-one degrees twenty-two minutes west, sir."

"Very good: Lay off a course from this point to a point ten miles north by west from Cape Race light."

In less than ten minutes Eric was back with a diagram of the course, which the officer inspected thoroughly.

"You may steer the course," he said.

Eric's nerves were in good control, but he had a jumpy feeling when he realized that he was actually in charge. Once, and only once, he got a little panicky, and, turning to the officer on the bridge, said:

"Should I keep her out a bit, sir?"

"You are steering the course," was the officer's reply. It was all up to the boy.

"Make it nor'west by west half west," Eric said a little tremulously to the helmsman, as they came in sight of Sankaty Head on Nantucket Island.

"Nor'west by west half west, sir," the helmsman repeated, porting his helm a trifle.

After the ship had proceeded a certain distance, the lieutenant called another of the first-class men on the bridge and he took his turn. At the end of the trip the officer summoned the class.

"Mr. Swift," he queried, "why did you not take the Muskeget Channel?"

Eric colored.

"I hadn't remembered exactly, sir," he explained, "the depths of the channels near the Cross Rip Shoals. I think I had them right, sir, but I wasn't sure enough of myself to feel that I ought to risk the ship."

"You will remember them, hereafter?"

"Yes, sir."

"Mr. Van Sluyd," continued the lieutenant, turning to another member of Eric's class.

"Yes, sir."

Courtesy of U.S. Bureau of Lighthouses.

THE LIGHTSHIP THAT WENT ASHORE.

Columbia River vessel which blew over a sand-bar and had to be taken overland through a forest to be launched again.

Courtesy of U.S. Bureau of Lighthouses.

GUARDING THE GRAVEYARD OF THE DEEP.

The Diamond Shoal Lightship, anchored outside the quicksands off Cape Hatteras that no other vessel can face and live.

"Near Monomoy you stood in a little too close. Keep farther out from the Shovelful Shoal. If, for any reason, you are compelled to go as close as you did to the point, keep the lead going."

"Yes, sir."

"Mr. Cunningham?"

"Yes, sir."

"In rounding Cape Cod, sailing an arc, change your course more frequently. It will save time and coal."

"Yes, sir."

And, in similar fashion, the officer took up each little detail, dealing with the first-class men after they had shown what they could do. From that test of responsibility many of the cadets came down, white-lipped. It was a striking test of a lad's character as well as of his abilities. Some daring youths would shape as close a course as possible, shaving dangers by the narrowest margin. They were reminded that if a Coast Guard cutter touched bottom, no matter how lightly, even without the slightest injury, there would be an investigation. If it were found that the officer in charge had been guilty of negligence, even in the smallest degree, court martial was possible.

Other cadets, again, timid by nature or not sure

of the course, would steer a long way round. They would be reminded of wastage and also of the fact that in rescue work, minutes, even seconds, might mean everything. If, under the test, a cadet showed ignorance of his duties, then he was in for a grilling.

In gunnery, Eric did not shine. He could always work out the necessary problems of elevating the gun to the right height and figuring out the drop of a shell of a certain weight at a certain distance. Yet, in spite of himself, there was always some little trick he could not catch. That was Van Sluyd's specialty. He had the " feel " of it, some way, and by the end of his third year he was as expert in gunnery as Eric was in seamanship. In the handling of a ship Eric was easily the best in his class. It was not until nearly the end of this third and last cruise on the *Itasca,* however, that he found his opportunity for personal distinction.

It was a dark, blowy night. Eight bells of the second dog watch had only been struck a few minutes before and the officers were chatting after dinner. Eric was on duty on the bridge with the second lieutenant, when the wireless sending apparatus began to buzz " S O S," " S O S," as the

operator relayed a message he evidently had just received. At the same moment the shrill whistle of the speaking-tube that connects the bridge with the wireless room was heard.

"You may answer, Mr. Swift," the lieutenant said.

Eric picked up the tube, answered "Hello!" and then repeated the operator's words to the officer:

"Liner *Kirkmore,* on fire and sinking, forty-one degrees, eleven minutes north; thirty-five, sixteen west; crew and passengers to boats."

With a word to Eric, the lieutenant dispatched the messenger to report to the captain, plotted the position of the *Kirkmore* on the chart, and, less than two minutes after the receipt of the wireless message, the *Itasca* had changed her course and was speeding under forced draught into the night. The cutter had broadcasted the call and word had been received from land stations and other vessels that the call had been heard. Still the *Itasca* was one of the nearest to the reported location of the vessel in distress and she fairly hissed through the water.

Presently there was another message from the wireless room, and, as before, Eric took up the

speaking tube and reported to the officer of the deck.

"'Very strange thing, sir,' he repeated, after the operator, 'I'm picking up a faint call from a small apparatus. I think it must be on one of the boats. The *Lucania* is racing for the *Kirkmore,* I've picked up her call.'"

"Ask him what he considers strange?" said the officer.

Eric put the query and again repeated:

"He says, sir: 'It's this way, sir. The first call stated that all the passengers and crew had taken to the boats.'"

"Well?"

"That call has been repeated several times and every one picked it up that way. Then there's a message coming from the boats, giving just where they are."

"That all seems straight enough."

"Yes, sir. But the operator says the wireless is still working on the ship!"

"On the *Kirkmore?*"

"Yes, sir. And Jenkins says he is sure that it's not the regular operator. It's an amateur."

"That sounds as if there were some people still left on the ship. Ask him what the message is?"

Eric transmitted the request.

"He says it's the same call, sir, exactly."

"The first one?"

"Yes, sir. That every one is in the boats. Only he says it's given jerkily and very slow."

"Find out what you can about it, Mr. Swift."

"Yes, sir."

Eric ran down to the wireless room.

"Acts like a man who doesn't know much about wireless, sir. I'm sure, sir, that it couldn't be the operator, not even on a tramp steamer. There's hardly an amateur who would make such a mess of it," said the operator.

"What does he say?" asked Eric. "Can't you get word to him?"

"No, sir. That's what's puzzling me. I've called and called, and he pays no attention."

"Do you suppose your sending apparatus is in good order?"

"Yes, sir," the operator replied. "Working perfectly. There's two or three other ships calling the *Kirkmore,* and she doesn't answer them either. I've talked to most o' them, sir."

"Who's the nearest?"

"We seem to be nearest to the ship, sir," said the operator, "but the *Lucania* is the nearest

to the boats. They seem quite a bit to the south'ard."

"Running into the line of travel, I suppose," said Eric. "What do you think is the meaning of that call?" he added.

"I think, sir," said the operator, "somebody must have been forgotten and left behind."

"But why doesn't he answer?"

"Maybe the receiving apparatus is broken down. There it is again, sir," the Coast Guard operator paused. "No, sir, it's not the operator. I don't think I could even tell what he means if it hadn't been gone over so often."

"Well," the captain said, when Eric reported the circumstances, "if the *Lucania* is nearer the boats than we are, and we are nearer the ship, we'd better find out who's sending that call."

"Yes, sir," Eric answered formally.

In the meantime the knowledge of the disaster had spread through the ship, and there was much excitement, when, one point off the port bow, the glare of the burning steamer showed against the murk of midnight.

Every one not on duty, and those on duty who were able, ran to the port rail. As the *Itasca* steamed on, under forced draught, quivering as

her engines throbbed under her, the flare on the bow increased in brightness. In half an hour's time it could be quite clearly made out as a steamer on fire, the dense cloud of smoke being illumined from below by the glare of the flames.

"I hope the operator was wrong. If there is anybody on board," said Eric, in a low voice, to his friend Homer, "they wouldn't have much chance."

"Is the call still coming?" his chum asked.

"No," Eric answered, "nothing for twenty minutes."

The Coast Guard cutter speedily raised the hull of the burning steamer. Her stern was much higher out of water than her bow, and amidships she was all aflame, belching up dense volumes of smoke.

A message came into the radio room.

"The *Lucania* reports that she has picked up three of the boats," said the operator through the tube to the first lieutenant on the bridge. "The fourth boat is still missing."

"What's that craft over there, I wonder?" queried Eric, pointing to the starboard bow where a searchlight flickered into the sky.

"That's the *La Savoie,* I heard some one say,"

his friend replied; "she must have been coming up on the jump. We'll have half a dozen big liners here before morning."

"It's a wonderful thing, the wireless," the boy said meditatively; "from hundreds of miles away, every one rushes to the rescue. When you realize that every extra ten miles means hundreds of dollars out of the pockets of steamship companies and every hour's delay may be a serious inconvenience, it does look great to see the way every one drops personal concerns to go to the rescue."

"I wonder what would happen if a captain didn't?"

"There'd be a whale of a row. Court-martial and all that sort of thing."

"You can't court-martial a merchant-service man," protested Homer.

"He'd lose his ship, anyway."

"But suppose he made out he didn't hear the call?"

"Be sensible," Eric retorted. "How could he do that? Bribe the operator, or threaten him?"

"That's true," said Homer, thoughtfully. "It would look pretty bad if the wireless outfit on a ship was shut down, as soon as an 'S O S' came in."

"I don't believe there's a wireless operator in the business who'd stand for it," the boy declared. "They're a high-grade bunch of men. I'd be willing to bet if any operator got such an order, before he quit he'd send out a message to the nearest station or ship, telling the whole story."

"And then what?"

"Why, if the wireless was shut down then, and the operator told the truth of it, they'd tar and feather that skipper. Commercialism may be all right on land, but when you come right down to the bones of the thing, there's mighty few men on salt water that'll ever do a dirty trick to another man."

"Right you are," agreed Homer; "a shellback is the real thing in a pinch. By ginger," he continued, "doesn't she burn! Surely there can't be anybody on board of her."

The *Itasca* was now rapidly approaching the burning steamer. Amid the roar of the flames and the hiss of the sea against heated iron was heard the thin whine of the speaking tube whistle.

"Call from the burning steamer, sir, I think," said the operator, "but there's no meaning to it."

The captain spoke rapidly to the first lieutenant and the good ship began to tremble from stem

to stern as the engines were reversed and the helm shifted so as to bring the sea a little on the port bow.

"Mr. Sutherland," came the first lieutenant's voice, "clear away the starboard whaleboat."

Eric stepped forward, for this was his station. The boat's crew sprang to their stations, the whaleboat was lowered to the rail, and as the *Itasca* lost her headway, the boat was neatly dropped in the water. The sea had looked a bit rough from the bridge, but down at the water's edge the waves were distinctly high.

Lieutenant Sutherland, who was also the instructor in mathematics, was an absolute wonder in many ways, but small boat work was not much in his line. Still, he handled her well. To Eric, of course, the rough sea did not matter. He was used to that in his life-saving work, and, indeed, every one forgot the danger as the boat pulled on in the lurid crimson of the burning ship. They came close, and hailed.

There was no answer, nothing but the dull roar of the flames in the hold and the spitting hiss as some spray was flung over the vessel's side. No one appeared on deck. The bow, where it was high above the water was cherry red hot,

and even the more submerged stern seemed absolutely untenable.

"There can't be any one on board," said the third lieutenant. "You didn't hear a hail?"

"No, sir," answered Eric, "but Jenkins caught another call just before we left."

"Very strange," commented the officer, looking thoughtfully at the derelict. The boat was pulling up towards the lee side and the smoke was stifling. The burning steamer was rolling heavily and there was a litter of wreckage to leeward.

"Can't board there," the officer said to himself. He gave orders to pull again to windward.

"Men," he said suddenly, "there may still be some one aboard that craft. Who'll volunteer?"

A chorus answered him. Almost every man of the crew volunteered.

"Which of you is the best swimmer?"

There was a moment's pause and then one of the sailors answered,

"Maryon is, sir."

"Do you think you can get on board?" the officer said, turning to the sailor mentioned.

"I can get to her all right, sir," the sailor answered, "and I'll try to get on board."

"You may try then," was the reply; "we'll

drop you right by her. You can swim around the stern and try the lee quarter."

The sailor stripped, and fastening a light line under his arms, waited for the boat to take the required place. How Eric wished that the Eel were there! But Maryon was a fair swimmer, and as soon as he struck out for the ship, the boy felt that he need have no fears for him. The sailor was still a couple of fathoms away from the side of the ship when, suddenly, a piece of wreckage up-ended on a sea and struck him. Those in the boat could not see how heavy was the blow, but it was clear that the sailor was incapacitated, and the crew hauled him inboard. He had a nasty cut on his cheek and his collar-bone was broken. While his hurts were being attended to, Eric saluted the officer.

"Well, Mr. Swift?"

"Mr. Sutherland," he said, "I've done a lot of life-saving work, sir."

"Well?"

"I'd like to volunteer, sir, if I might," the boy replied.

"You don't think it's too much for you?"

"No, sir."

"I remember. You are an expert swimmer, are you not?"

"Yes, sir."

"You are sure of yourself?"

"Yes, sir."

"Very well, Mr. Swift," the officer answered, looking over him keenly, "You may go."

With a quick pulse in his ears throbbing in excitement and elation, the boy slipped out of his cadet uniform and tied the life-line round him. A swirl of eager oars brought the boat again beneath the stern of the burning steamer. Eric plunged into the sea, the thought flashing through his mind as he did so that he wished he could make a spectacular dive like those he used to envy in the Eel. That he was a swimmer showed itself the minute he touched the water. Without appearing to use one-half the effort Maryon had needed, the boy covered the distance between the boat and the flaming vessel in a few long strokes, watching warily for wreckage.

There was a treacherous suction as the vessel rolled, but Eric, trained to every form of danger in the line of rescue, kept close guard. He knew better than to make a false move from too great

haste, and swam round cautiously, seeking for a place to board. The heat from that floating mass of belching flame was terrific, and more than once, as a gust brought down a cloud of fumes over him, the boy thought he would suffocate.

At last he saw, trailing over the quarter, a wire rope, one of the stays of the after derrick, and he made ready to climb. The stay evidently had been melted through at the derrick head, but the heated end had fallen in the water and cooled. Up this the swimmer swarmed, though the frayed wire drew blood from his hands and legs at every point he touched it. At last he reached the bulwark, grasped it and jumped aboard.

With a sharp cry of pain he leaped back to the rail again.

The deck was burning hot!

In spite of the spray that now and again came spattering over the derelict, the heat had been conducted throughout the craft. Not having thought of the possibility of a heated metal deck, Eric was barefoot. Of what use was it for him to be on board unless he could find out whether any one were there! The decks were empty. The steamer had sunk too deep for any one to be below, and live. There was only one place in which a sur-

vivor might still be—the sole remaining deck-house.

Thither the wireless aerial led! There, if anywhere, was some deserted creature, author of the unread message that had sparked across the sea. There, and there only—and between Eric and that deck-house lay the stretch of red-hot deck, a glowing barrier to attempted rescue.

Surely it was beyond attempt!

Like a flash came to the boy's remembrance the old ordeal for witchcraft in which a man had to walk fifty feet over red-hot plowshares, in which, if he succeeded without collapse, he was adjudged innocent. At once Eric realized that some must have survived that awful test if the ordeal was of any value. What man had done, man again could do! It was at least as good a cause to save some man or woman from a fearful death as it was to save oneself from penalty of witchcraft.

Daring all, he leaped down from the rail on to the superheated deck.

In spite of his stoicism, the boy could not repress a cry of agony, that rang cruelly in the ears of his comrades in the boat. They had seen his figure outlined black against the red glare of

the burning craft, and exulted. At the boy's cry, they shuddered, and more than one man blenched.

The iron seared and crisped his flesh as his feet touched the torture. He could feel the skin curl and harden. Gritting his teeth, he sped at topmost speed of the house whither the aerials led.

The door was jammed!

Though the skin of his head seemed to tighten like a metal band, though his lungs stabbed within him as he breathed, though the pain in his feet was unendurable, Eric wrenched again and again at the handle, but the door would not budge. He called, but there was no answer. Almost delirious with baffled rage and excruciating suffering, the boy hurled himself against the door, throwing his shoulder out of joint with the power of the blow. The door fell inwards and he fell with it.

The heat that poured from the room was overpowering, a dull red glow in the far corner of the floor showing that the flames were immediately beneath. With a gasp and a clutch on his reeling senses, Eric saw stretched out on the wireless table before him the figure of a man, moaning slightly, but insensible. Unable to stand on the hot floor, unable to escape from the room in

which he had become trapped, he had lain down on the instruments and his writhings near the key had sent those tangled messages that the operator on the *Itasca* had not been able to understand.

Had it not been for the instinctive stimulus of his life-saving training, Eric would have deemed that the man was beyond help and would have sought safety himself. But his whirling senses held the knowledge how often life lingers when it appears extinct. Scarcely conscious himself of what he did, Eric grasped the unconscious man in his arms, raced back across the terror of the red-hot deck, reached the stern—how, he never knew—threw his moaning burden overboard and dived in after him.

The shock as his parched and blistered body struck the cold sea water steadied Eric for a second, just long enough to grasp the man he had rescued, as the latter came floating to the surface. Then the pain of the salt water upon his cruel burns smote him, and he felt himself give way.

He tugged twice at the life-line as a signal that he was at his last gasp, bidding them pull in. Then, gripping the last flicker of his purposed energy on the one final aim—not to loose hold in

the sea of the man he had rescued from an intolerable death, the boy locked himself to the sufferer in the "side carry" he once had known so well.

A sinking blackness came over him, flashes of violet flame danced before his eyes, his head suddenly seemed to be as though of lead, his legs stiffened and refused to move, and in the lurid glare of the burning steamer, rescuer and rescued sank beneath the waves. The last thing that Eric felt was the tug on the life-line underneath his arms. His cry for help was answered! The Coast Guard boat was near.

CHAPTER VII

REINDEER TO THE RESCUE

When, the following morning, Eric awoke to consciousness in his bunk on the *Itasca* he found himself the hero of the hour. He had been well-liked in his class before, but his daring feat increased this tenfold. Like all clean-cut Americans, the cadets held plucky manliness to be the most worth-while thing in the world. The surgeon, who was bandaging his burns, told him, in answer to the boy's questions, that the rescued man would probably recover.

"You're not the only one I've got to take care of, though," the doctor said to him. "Van Sluyd's in sick bay this morning, too."

"What's the matter with him?" queried Eric.

"Van Sluyd's got grit," was the reply.

"What did he do?"

"I'm just going to tell you. About half an hour after the two of you had been brought on board, and while I was still examining your

burns, Van Sluyd came up and asked if he could have a word with me.

"'Of course,' I answered, 'what's on your mind?'

"'My father's a doctor,' he said, 'and I've picked up a little medicine. Is the fellow that Swift rescued badly burned?'

"'Yes,' I answered, 'he is.'

"'Wouldn't he have a better chance if some skin-grafting were done?'

"'Not a bit of doubt of it,' said I.

"'Then,' he said, 'if it won't incapacitate me for the service, you can go ahead on me.'"

"Who'd have thought it of Van Sluyd!" exclaimed Eric. "Talk about nerve, that's the real thing! What did you do, Doctor?"

"I went and had a chat with the captain and told him just what was needed. I told him that it would put Van Sluyd out of active training for several weeks and might set him back in his examinations."

"What did the captain say?" questioned the boy.

"He just asked me if I thought that the man's recovery was in any way dependent on it, and when I said I thought it was, he answered that I

could go ahead. You can be sure Van Sluyd won't lose out by it."

"But won't it cripple him?"

"Not a bit," the surgeon answered. "I'll just take a few square inches of skin off the thigh and he'll be all right in a few weeks."

"Won't he have an awful scar?"

"There'll be a bit of a scar. But he won't have any more scars than you, at that, my boy."

"Are my feet going to take a long time to heal, Doctor?"

"I'm afraid it'll be quite a while before they feel all right. We'll have you up and around before examinations, however, just the same. That's more than I can say for my other patient, though. He's badly burned."

"Have you found out who he was?" queried Eric.

"Certainly. He's the chief engineer of the craft, or, to speak more rightly, he was the chief engineer."

"How do you suppose he got left behind?"

"That's quite a story," the surgeon answered, as he tore off a piece of bandage. "He's too sick to do much talking, but it seems that when the fire was reported beyond control he sent all hands on

deck out of the engine room, remaining behind himself to look after the pump-engines. The passengers and crew immediately took to the boats. When he tried to get up on deck a few minutes later he found that he was cut off. He had to get a crowbar and wrench his way through an iron grating, before he could get to the open air.

"In the meantime, every one supposed that he was in one or other of the boats, and they had pushed off, leaving him marooned. For an hour or more the flames smoldered, and the deck was quite bearable. He tried to gather materials for a raft, but almost everything on the ship was iron. The cabin fittings were wood, but he couldn't find an ax, the sockets where the axes were usually kept being empty.

"Then he remembered that the wireless instruments were clamped on to a wooden bench and he went into the deck-house to try to tear that apart. The door slammed as he went in, and while he was yanking at the bench the ship buckled and the pressure jammed the door, making him a prisoner. He seems to remember very little after that, but he must have tried hard to get out, for he broke his arm in some way."

"How about the wireless messages?"

"He says the operator had jotted down the original message he had sent, and he tried to repeat it as best he could. Of course all that last stuff no one could understand was sent when he was semi-conscious."

Eric winced as the other touched his shoulder.

"Get ready now," the surgeon said, "I'm going to snap that bone back into place. Ready?"

"Go ahead," the boy answered through set teeth.

The surgeon gave a quick sharp twist and there was a click as the shoulder went back.

"That's going to be a bit sore for a while," he said, "but you ought to be mighty thankful you put it out of joint."

"Why?"

"You'd have broken something instead, if it hadn't slipped," was the reply; "you must have hit that door an awful welt, for you're bruised on that side from the shoulder down. Just black and blue with a few touches of reddish purple. You're an impressionist sketch on the bruise line, I tell you! But there's nothing serious there.

Using your carcass for a battering ram is apt to make a few contusions, and you've done well to get off so easily."

"I had to get into that deck-house. I wanted to be sure no one was there."

"It took more than wanting," the surgeon said, "you must have been just about crazy. A man's got to be nearly in the state of a maniac before he'll hurl himself against an iron door like that without thinking of the consequences to himself. You were out of your head with pain, Swift, the way it looks to me, you'd never have tried it in your sober senses."

"Glad I got crazy, then, Doctor," said Eric, gingerly moving himself a fraction of an inch, but wincing as he did so; "if I hadn't, I'd have failed."

"Well," the surgeon said, rising to go, "I think the fates have been mighty good to you, Swift, if you ask me. There's many a man has the daring and the pluck to do what you've done, but never has the chance. You had your chance. And you made good!"

As a matter of course, Eric's bunk became a center round which the other cadets gravitated, and his classmates did everything they could to

make things as pleasant for him as possible. He was glad, none the less, when two or three days later, he was told that he might go up on deck.

The boy was scarcely aware of it, but with his shoulder and arm bandaged and both feet heavily swathed, he made rather a pathetic sight, which his white and drawn face accentuated. A hammock had been rigged up on the sunny side of the deck and to this he was carried.

Just as soon as he appeared on deck, for an instant there was a cessation of all work that was going on. Then, suddenly, started by no one knew whom, from the throat of every man on deck came a burst of cheers. It was the tribute of gallant men to a gallant lad.

Weakly, and with a lump in his throat, Eric saluted with his left hand, in reply.

It was an infraction of discipline, no doubt, but the officer in charge of the deck ignored it. Indeed, he was afterwards heard to say that he had difficulty in not joining in himself. A little later in the day, the captain himself came on deck. Before going below, he came amidships where Eric was lying, feeling weak, but thoroughly happy.

"I have the pleasure of informing you, Mr.

Swift," he said, formally, " that I have entered your name in the ship's log for distinguished services."

This was more than Eric could have hoped for and he saluted gratefully. The boy realized how much more significant was this actual visit of the captain than if it had followed the usual custom of a message sent through the executive officer of the ship, and his pride and delight in the Coast Guard was multiplied.

Naturally, under the conditions, there was a slight relaxation of discipline in Eric's case, and more than once the first lieutenant came and chatted to the lad. Finding out that he was especially interested in Alaska, the lieutenant talked with him about the work of the Coast Guard in the Bering Sea and the Arctic Ocean. The officer was an enthusiast about the Eskimo, holding them to be a magnificent race, enduring the rigors of the far north and holding themselves clean from the vices of civilization. As one of his classmates was taking up Eskimo language, Eric also took up the study of it, since he had spare time on his hands while in sick-bay. Meantime, however, he kept up his studies at top notch.

The value of the Eskimo language to him, how-

Courtesy of U.S. Coast Guard.

COAST GUARD CUTTER, *MIAMI*, ON JULY FOURTH.
Vessel on which Eric was lieutenant, dressed for national holiday and firing a salute.

ever, Eric never realized until the close of his third year. Though limping a good deal, he had been able to be up and around for a month before the exams and he had been slaving like a forty-mule team. Still, work as hard as he could, the boy was conscious that there were others who could surpass him. Especially there was one, a fellow called Pym Arbuthnot, who was a hard competitor.

They used to say of Pym that he could learn a subject by looking at the outside of a book, and his memory was as retentive as his acquisition was quick. He was always first—in everything but mathematics. There Eric had him. Often he blessed the memory of the old puzzle-maker, as week by week his success in mathematics kept him right abreast of his rival. When at last the exams came off and the lists were made known, Eric was second. He had not quite been able to catch up with Pym, who was first, as every one had expected. To Eric's great delight, moreover, Homer was first in the engineering class.

About a week later, the commandant called him into his office.

"Lieutenant Swift," he said, and the boy's

face glowed at this first use of the title, " you have been commissioned and ordered to the *Bear*. I am told that you know a little Eskimo."

" Yes, sir, a little," Eric answered.

" Your showing in the Academy has been creditable," the commandant continued, " and I have the pleasure of informing you that your appointment as United States Commissioner on the *Bear* on her next trip has been forwarded to me," and he touched a paper lying on the desk.

" I have to thank Mr. Sutherland for that, sir," Eric answered.

" It is a matter of record, sir," the commandant answered a trifle sternly, " that you have done your duty. Appointments in the Coast Guard, Mr. Swift, are made upon the single basis of efficiency and fitness. I have the honor to congratulate you upon your commission and to wish you well."

Walking from the commandant's office, Eric, now " Lieutenant Swift," met the first lieutenant. He looked so excited that the officer stopped and spoke to him.

" You wanted to speak to me? "

" I've been ordered to the *Bear,* sir," blurted out Eric, for a moment dropping the official speech

and talking eagerly, " and I've got the Commissionership, too! "

The first lieutenant raised his eyebrows slightly at the conversational form of address, but he realized that the boy was bubbling over with his news.

" I'm very glad, Mr. Swift," he said heartily; " perhaps you'll be able to use a little of that Eskimo you learned."

" I'm so grateful to you, Mr. Sutherland," Eric began, but the other stopped him with a slight gesture.

" I rather envy you your first trip into the Arctic," he said; " it's an experience that no one ever forgets. And you will find out for yourself whether I have overestimated the Eskimo as a race." He put his hand kindly on the lad's shoulder, as he noticed the slight limp, and remembered.

" You're going to extremes," he continued; " from the red-hot decks of a burning ship to the ice hummocks of the polar seas. In that country I'll pass on to you a word of warning that Commodore Peary once gave me. Make it your motto in the Arctic. It is this—' Be bold, but never desperate.' "

With a grateful answer, and with his commission as third lieutenant and his appointment as

United States Commissioner in his hand, Eric walked out a full-fledged officer of the Coast Guard and Uncle Sam's representative in the Arctic seas.

Several weeks later, Eric reported on board the *Bear*. He had broken his trip west for a couple of days at home and had managed to snatch the time to run up to his old Coast Guard station and to visit his friend, the puzzle-maker. He really felt that he owed the initial success of his career to the old mathematician, and in this he was far more nearly right even than he imagined. He carried with him into the Arctic the old man's last advice.

"I'm gittin' old," the puzzle-maker had said to him, "not here when you come back. Life—he is like figuring, you think him straight, you work him careful, right every time!"

It was with a keen delight that Eric realized, when he boarded the *Bear*, that sailorship was not merely a thing of the books. Although he knew that the Coast Guard vessel was a converted whaler, it had never fixed itself in his mind that the *Bear* was a sailing vessel with auxiliary steam, and that she was handled as a sailing vessel. Barkentine-rigged, with square sails on the fore-mast and fore-and-aft rig on her main and mizzen,

Eric found later by experience that her sailing powers were first-class. His delight in the handling of the ship added to his popularity with his brother officers, all of whom, as older men, had been trained in clipper days.

At Seattle the *Bear* took aboard the mail for Nome and St. Michael. This consisted of over 400 sacks, an indication of the growth of a city which in the spring of 1897 consisted only of a row of tents on a barren beach. At Unalaska, in the Aleutian Islands, five destitute natives were taken aboard the *Bear* for transportation to their homes in St. Michael.

Off Nunivak Island, Eric had his first sight of polar ice, but the pack was well broken up and gave little trouble. Norton Sound was comparatively free of ice, however, and the *Bear* reached St. Michael's ten days later. As St. Michael's Bay was filled with ice-floes, the vessel anchored to await favorable conditions for landing mail. A " lead " or opening in the ice having formed between Whale Island and the mainland, after a clear night's work, the Coast Guard cutter dropped her anchors inside the ice. A couple of days later the floes cleared partly away and the *Bear* crossed over to Nome.

Endeavoring to make St. Lawrence Island, where the head government reindeer herder was to be landed, the *Bear* struck a heavy ice pack, and the little vessel had to give up the attempt to land. She worked to the northeast, out of the ice, and the captain changed the ship's course for King Island.

This was the first opportunity Eric had to use his U. S. Commissionership. One of the natives, who had been associated with the white prospectors, was accused of ill-treatment towards his children, a very unusual condition in the Arctic. He had boasted a good deal to the other natives that the United States had no judges so far north, and that the white men could not punish him. In order to teach him a lesson, Eric heard the case, found the man guilty and sentenced the native to a day's imprisonment in the ship's brig, in irons, releasing him shortly before the vessel sailed. A sick native, with his wife and three small children were taken on board, for transportation to the hospital at Nome.

The young lieutenant also made an inspection of Prince of Wales village. During the entire winter there had not been a single case of disturbance and hardly a case of sickness.

"There are mighty few villages of the same size in the States," said the surgeon to Eric, as they were returning to the boat, "which could show as good a record as these Eskimo villages. Nobody sick, nobody living on charity, nobody headed for jail!"

Returning to Nome, what was Eric's delight to find Homer Tierre awaiting them! He had been assigned to duty on the *Bear* to relieve one of the juniors, who had been assigned to another cutter, and the two young officers greeted each other warmly. The head government reindeer-herder was eager to get to his post, so the *Bear* made a second attempt, this time successfully.

On the island only one case came up before Eric as United States Commissioner, that of a native who had allowed his dogs to run in the reindeer herds, four deer having been killed. Eric, before whom the case was tried, ruled that the native should be made to pay for the deer. As the margin of living in those barren islands is very small, this was quite a heavy punishment, and struck terror into the hearts of the natives. They had been ignoring the government's regulations concerning the corralling of the huskies, believing

that there was no one with power to punish infractions of the law.

From there the *Bear* went to Cape Prince of Wales, and here Eric fell in with Joey Blake, the former first mate of one of the whaling vessels rescued by the famous Overland Expedition in 1897. For the first time Eric heard the whole story of that heroic trip when the Coast Guard sent three men to save the lives of three hundred men, imprisoned in the polar ice. He heard how the men who were now his brother officers had done that which no white man had ever done before, how they had gone from Nome to Point Barrow in the dead of winter, their only base of support in those months of frozen night being their own fortitude and resourcefulness.

Joey Blake, now in charge of the Point Barrow station of one of the commercial whaling companies, waxed eloquent as he told how the Coast Guard men had risked their lives over and over again, to reach the herd of reindeer, who might be driven on the hoof over mountains that had never before been crossed. He told how, thereby, they had saved from starvation and death the crews of several vessels fast in the crushing grasp of the ice-pack of the Arctic Seas. From one of the men

Courtesy of U.S. Coast Guard.

THE *BEAR* IN THE ICE PACK.

Courtesy of U.S. Coast Guard.

THE *BEAR* BREAKING FREE FROM THE ICE.

Whaler, still fast, left behind, while Coast Guard cutter forces her way clear.

who owed his life to that magnificent piece of daring, Eric learned the tale of the great march across the ice and round the inhospitable shores in the bleak darkness of the Arctic night. He understood why Congress had voted special thanks and medals to the three men who carried to success the greatest rescue in Arctic history, full as that record has been of sacrifice and heroism.

In November, 1897, word reached the United States that eight whaling vessels, with 287 men on board, were fast in the ice north of Point Barrow. Nothing was known of their condition, save that the provisions of the entire fleet could not be counted upon to give them food beyond the end of January. Possibly hunting and fishing might enable this to be spun out a month or so, but not more. The way through Bering Straits would not be open until June, at the earliest. Starvation, therefore, was imminent. The United States Government naturally turned to the Coast Guard —then known as the Revenue Cutter Service— well assured that whatever was possible in the realm of human courage and skill would be done.

Between the marooned whalers and civilization lay a thousand miles and more of the most fearful road that man has ever had to travel, a road un-

trod, with cold like to the bitterness of death as its constant state and the howl of the blizzard for its sole companion. Not only must this blind and awful trail be conquered, with possible disaster in every mile and a sure heritage of suffering and pain in every step, but food sufficient to last 300 men for over four months had to be taken over those desolate wastes.

The *Bear,* though only three weeks back from a six months' cruise in Arctic waters, was ordered back to the desperate attempt. There was no need to ask for volunteers in the Revenue Cutter Service. Every man in the service, from the most recently enlisted man to the Captain Commandant would have stepped forward. As it was, the expedition contained three of the ablest and most vigorous men in the entire service. It was under the command of Lieutenant Jarvis, with Lieutenant Bertholf (now the Captain Commandant of the Coast Guard) as the second in command. Only one other white man, Surgeon Call, accompanied the expedition.

The *Bear,* under sail and steam, headed for the north. Every mile gained by sea meant a vast help to the expedition. Yet, when Cape Nome was still 85 miles distant, the little vessel ran into thick

mush-ice. Beating around for clearer water the wind began to die down and the *Bear* was almost caught. Had she been frozen in then, ten miles to the east of Southeast Cape, the expedition would have been frustrated and the whalers left unrescued. It was a narrow escape and the commander of the *Bear* turned back to Cape Vancouver, and the next morning steamed to within five miles of a native village, not marked on any chart, but visible from the ship.

Minutes counted, and two boats were sent off to the shore. The settlement was found to be the village of Tununak, in which, by good fortune, was a half-breed trader, Alexis, who had dogs. On December 18th the overland expedition started, far south of Nome, with four sleds and forty-one dogs, nine dogs being harnessed to each of the sleds belonging to Alexis and fourteen to the heavy one from the ship. From Tununak they went to Ukogamute, and because a southeast wind had cleared away the ice from the shore, the party was compelled to climb a range of mountains between the two villages.

"Did you ever climb a mountain with a dog team?" queried Joey Blake. "Take my word, it's some job. You've got to tackle a thing like

that to get the heartbreak of it. It's bad enough to have to run ahead of a dog team on the level, but in mountain country it's something fierce."

"Do you have to run ahead of the dogs?" Eric said in surprise. "What for? To break a trail?"

"Sure. A dog team can trot faster than a man can walk but not as fast as he can run. So a fellow's got to run in the deep snow a hundred yards or so, then walk, then run, an' so on. I met Alexis a year or two after the expedition an' he told me all his troubles. They got to the top of the mountain, he said, in the midst of a furious snowstorm. It was so thick that the natives could not decide on the road an' it was impossible to stay up on the crest without freezin' to death. At last they decided to chance it. The side of the mountain was so steep that the dogs couldn't keep up with the sleds an' there was nothing to do but toboggan to the bottom of the hill.

"What fun," exclaimed Eric.

"Ye-es," the other said dubiously, "but it was a two-thousand-foot slide! They wound small chains around the runners of the sleds to try an' check their speed a little, an' hoping that they wouldn't hit anything, let 'em go. Just as the first

sled had begun slidin', Alexis told me he called out that he thought they were a little too much to the north an' all the sleds would go off a precipice into the sea. It was too late to stop, then. It took three hours to climb one side of the mountain, an' less than three minutes to go down the other side.

" From there they went straight along the coast to Kiyilieugamute, where they had reckoned on gettin' dogs to replace the young dogs on the ' scratch teams ' Alexis had made up. All the dogs had gone on a trip for fish an' the natives said it would be two days before they arrived. So Jarvis went ahead with the two good teams, leavin' Bertholf to follow as soon as the native dogs arrived. Four days of hard traveling, stoppin' at Akoolukpugamute, Chukwoktulieugamute, Kogerchtehmute, and Chukwoktulik brought 'em to the Yukon at the old Russian trading post of Andreavski.

" On the Yukon, I guess they made good time. You know, in the fall, when there are sou'westerly gales in the Bering Sea, the water rises in the lower Yukon, an' as it freezes quickly, there may be a trail of smooth glare ice for miles. Then there's prime traveling. But, often as not, the

water flows back again before the ice is thick enough to travel on. It makes a thin shell, an' dogs, sleds an' everybody goes through an' brings up on the solid ice below.

" As a matter of fact, it put Jarvis' teams down an' out; most of his dogs were bleeding at every step from ice-cuts in the cushions of their feet. He had trouble with the natives, too. Two of them got violent colds, an' they were no use for traveling."

" Seems queer to think of Eskimos catching cold," said Eric; " now if it had been Lieutenant Jarvis, I wouldn't have been surprised."

" There's nothing as tough as a white man," said the whaler. " If you look up stories of explorers you'll always find it's the natives that get used up first."

" Why, do you suppose? "

" A white man is more used to putting out energy. After all, natives are lazy, an' a white man on an exploring expedition or a rescue is pushing natives faster than they have ever been used to going."

" He's taking the same trouble himself! " objected the boy.

" Sure, he is. But then, in one way or another,

he's pushing all the time. Jarvis told me that the next two or three days were bad. Off Point Romanoff the ice-crush was piled high an' they had to lift the sleds over the hummocks for two days on end. A snowstorm came up in the middle of it, an' I guess it was touch and go until they made Pikmiktallik, nine miles further on. Next day, late in the afternoon, they drove into St. Michael's, havin' covered three hundred and seventy-five miles in twenty-one days, with only one day's rest.

"The story of how Jarvis got teams at St. Michael's and Unalaklik is a yarn all by itself. Anyway, he got 'em, and on January fifth left Unalaklik, by a mountainous trail along the shore. A wild bit of road delayed 'em before they reached Norton's Bay. On the further shore, I guess they had real trouble. Jarvis told me—and the phrase has stuck in my mind ever since—that the ice looked like a cubist picture. I've seen stuff like that, but I never had to travel over it."

"It sounds awful," said Eric.

"It's worse than that," was the reply. "I don't want any of that sort of travel in my dish, thanks. Well, to go on. It was right there that Jarvis' an' Bertholf's trail divided. Orders had

been left at Unalaklik for Bertholf to go on an' meet Jarvis at Cape Blossom, on the north side of Kotzebue Sound, with a thousand pounds of provisions."

"How could he catch up with Jarvis with a load like that," queried the boy, "when the first part of the expedition was traveling light?"

"Jarvis had to make a nine-hundred-mile roundabout, clear the way round the Seward Peninsula," explained the whaler.

"What for?"

"To get the reindeer."

"That's right," said Eric. "I forgot about the reindeer."

"They're the whole story," the other reminded him. "They couldn't have got food up to us with dogs, nohow. It would have taken an army of dogs."

"I don't see why?"

"You've got to feed dogs," was the answer. "Two hundred an' fifty pounds is a good weight for a dog team an' half of that is dog-feed. The food for the humans in the party is nigh another fifty pound. So, you see, a dog team on a long journey will only get in with about a hundred pounds. At the rate of a pound a day a man for

Courtesy of U.S. Coast Guard.

REINDEER MESSENGERS OF RESCUE.

Courtesy of U.S. Coast Guard.

REINDEER THAT SAVED THREE HUNDRED LIVES.

Part of Charlie Artisarlook's herd, driven a thousand miles through blizzards by three Coast Guard heroes.

four months, it would take all of five hundred dog teams of ten dogs each to get the stuff up there! An' what would you do with the five thousand dogs when you got 'em up there?

"No, winter travel in Alaska's got to be by reindeer. You mayn't know it, but it's the U. S. Government that has made the Eskimos happy. There's one man, Sheldon Jackson, of the Bureau of Education, who's brought more peace and happiness to a larger number of people than 'most any man I know."

"How? By introducing reindeer?"

"Just that," the whaler answered. "The Eskimo would have been wiped off the face of the earth but for that one man's work. He started the reindeer idea, he brought in a few himself, he got the Government interested an' now reindeer are the backbone of northern Alaska. Our steam whalers had driven the whales an' the walrus an' the seal so far north that the Eskimo couldn't reach them. They were slowly starvin' to death by hundreds when Uncle Sam stepped in. And your captain commandant, that's Bertholf, who I'm telling you about now, he did a lot for Alaska when he brought in the bigger breed, the Tunguse reindeer, which are comin' to be the real beasts o'

burden here in the north. It was knowin' what could be done with reindeer that sent Jarvis round to Point Rodney and Cape Prince of Wales to get the herds together an' start 'em north."

"I thought," said Eric, wrinkling up his forehead, "there was a herd nearer than that. How about the Teller Station at Port Clarence? Isn't that a reindeer layout?"

"It is," said the old whaler, "but distress among the miners in the Upper Yukon had been reported earlier, an' that herd had been started off for there. Jarvis figured on rounding up Artisarlook's herd at Point Rodney, and the Government herd under C. M. Lopp at Cape Prince of Wales, an' arrangin' to drive 'em to Point Barrow. Then, by pickin' up Bertholf, who was to cut straight across the Seward Peninsula with the dog-teams and the provisions, he would be sure of having enough supplies to push north.

"Then Jarvis struck snow-drifts! The guides traveled with snowshoes an' did their best to make a trail, Jarvis doing a big share o' the work. The runners of the sleds went clear down an' the dogs sank nearly out of sight in their struggles to move 'em. The men had to go backwards and forwards a dozen times in front of the sled, stamping it

down hard. Then the dogs would drag it ten feet or so an' they'd have to pound the snow again. There's something that's exhaustin'. Even the dogs played out an' simply lay down in the snow, refusin' to go any farther."

"Without any shelter?"

"Huskies don't need any shelter. They're tough brutes so far as weather is concerned. Durin' the coldest winter weather in the worst blizzards they'll curl up anywhere on the snow an' sleep, an' when the snow has drifted over 'em, get up, shake themselves, an' lie down in the same place again for another sleep."

"They scrap a lot, too, don't they?"

"At feedin' time. When bein' fed they are like wild animals an' snarl an' bite each other, keepin' up one continual fight until everything is eaten. It's more than one man's job with a club to keep 'em quiet enough for all the dogs to get their share. But when all the grub is done with, they'll get moderately quiet again.

"At Golovin Bay, Jarvis found the Teller reindeer herd under Dr. Kettleson. He was on his way to St. Michael for the Upper Yukon, same as I told you, an' had started from Port Clarence three weeks before but had been stopped by the deep

snow. So Jarvis sent back the dog teams to Bertholf, who was waiting for them at Unalaklik, and started out with reindeer teams."

"How do reindeer travel?" queried the boy.

"All right, in winter, but they're irregular," the other replied. "Every one has got to be ready in the morning for the start, for the instant the head team moves, all the deer are off with a jump, full gallop. For half an hour or so they go like an express train, then they sober down to a more steady rate of speed, an' finally, when they are tired, they'll drop into a walk. Jarvis' deer played him a nasty trick on this trip."

"What was that?" asked the boy.

"It was on the way to Point Rodney. It was blowing a living gale an' the snow was blinding. In the dark Jarvis' deer wandered from the trail, got entangled in a lot of driftwood on the beach, which was half covered over with snow, took fright, an' finally wound up by running the sled full speed agin a stump, breakin' the harness, draggin' the line out of Jarvis' hand an' disappearin' in the darkness an' the flying snow. Luckily Jarvis knew enough not to try and follow him. He stayed right there."

"All night?" queried the boy.

"Luckily, he didn't have to," the other answered. "Two hours later, a search party found him. They dug a hole in the snow an' camped right there.

"The next day they only made five miles. The storm was so bad that the man breakin' trail couldn't stand up an' had to crawl on his hands and knees. Even the reindeer wouldn't travel in a straight line, wantin' to turn their tails to the blast. This would have taken the party straight out to sea over the ice. After three days' delay, Jarvis insisted on travel, an' he nearly had a mutiny on his hands. But he put it through. He's one of the kind of men that always keeps on going!

"Then came the time for diplomacy. Jarvis had to persuade 'Charlie' Artisarlook, just on his say-so, to give up his whole herd, his entire wealth, promisin' that the same number of deer should be returned. As a small village had grown up around this herd of Artisarlook's—which made him quite the most prominent member of his race for miles around—an' as they depended entirely for their food and clothing on the reindeer herd, it was like askin' a city to empty its houses of everything for the sake of men they'd never even seen.

I think it says a lot for the Eskimos that they agreed."

"It's bully!"

"That's me, too. It's something to give up every penny you own merely on a promise that it will be returned, to leave your wife, family an' neighbors starving, an' go eight hundred miles from home in an Arctic winter over a terrible road to help a party of white men in distress.

"When Artisarlook agreed, Jarvis and he went on ahead, leaving Surgeon Call to follow with the herd to Cape Prince of Wales. This, Jarvis told me, was one of the worst bits of road on the entire trip. Here's what Jarvis said himself about it:

"'As I remember it, the thermometer was over thirty below zero and there was a tidy blizzard blowing when we started for Cape Prince of Wales. The going was rough beyond words. In the afternoon, suddenly Artisarlook wanted to camp, but I thought he was trying to work on my fears, so I made him go on. But the boy was right, for shortly after it got dark we struck the bluffs near Cape York and our road was over the ice crushes that lined the shore.

"'I have never seen such a road. Artisarlook

went ahead to try and pick out the way, if indeed it could be called a way, which was nothing but blocks of ice heaped in confusion and disorder. I stayed behind to manage the heavy sled which was continually capsizing in the rough ice. By eight o'clock I was done out and quite willing to camp. But this time Artisarlook would not stop. It was too cold to camp on the ice without shelter or wood—the ice we were on was in danger of breaking away from the bluffs at any minute, and then it might be the end of us. We must get on beyond the line of bluffs before stopping.

" ' To make matters worse I stepped through a crack in the ice into the water, and, almost instantaneously, my leg to the knee was a mass of ice. I was now compelled to go on to some place where the foot-gear could be dried. As though in a dream, suffering the most horrible tortures of fatigue, we pushed on dispiritedly until midnight, when we came to a small hut about ten by twelve, in which fifteen people were already sleeping. It was the most horrible place I have ever been in, but, at the same time, I was never so happy to be under a roof before. Though I had eaten nothing all day, I was too tired to do more than to crawl into my sleeping-bag and sleep.

"'The blizzard raged as fiercely outside as on the day before, but I could not stay in that pestilential and filthy hut. Even Artisarlook—and an Eskimo is not over-particular—found difficulty in eating his breakfast. For my part—I could not breathe. The air was horrible and it was refreshing to get outside and to be going through the storm and over the rough ice. Fortunately there was another village about ten miles further on and we stopped there and had a good meal to fortify ourselves against the battle around the mountains of the Cape York.

"'At last I had struck the worst road in the world. All the tremendous pressure of the Polar Seas forcing the ice to the southward was checked by the land masses of Siberia and Alaska. The ice, twisted and broken, crushed and mangled, piled in a welter of frozen confusion along the shore. Darkness set in before we came to the worst of it, and a faint moon gave little light for such a road. For fifteen miles there was not ten feet of level ground. Though the temperature was thirty below zero, Artisarlook and I were wet to the skin with perspiration from the violence of the work. We would have to get under the heavy sled and lift it to the top of an ice hummock some-

times as high as our shoulders or even higher and then ease it down on the other side. Three times out of four it would capsize.

" ' It was a continuous jumble of dogs, sleds, men and ice—particularly ice—and it would be hard to tell which suffered most, men or dogs. Once in helping the sled over a bad place, I was thrown nearly nine feet down a slide, landing on the back of my head with the sled on me. Our sleds were racked and broken, our dogs played out and we ourselves scarce able to move when we finally reached Mr. Lopp's house at the Cape.' "

" Glorious! " cried Eric, his eyes shining; " they won through! "

" Yes, they got through all right," the whaler answered. " They still had a terrible journey ahead of them, but success was sure. Two or three days later Dr. Call reported with Artisarlook's herd. Lopp, of course, was an expert in handling deer an', besides, knew the country well. With sleds and over four hundred reindeer, equipped in every way except for provisions, Jarvis started for the north. He met Bertholf at the appointed meeting-place, Bertholf having done miracles in crossing the divide with the provisions.

" Meantime Lopp took a chance with the deer that no one less experienced in local conditions dared ha' done. In the teeth of a blizzard he forced the deer herd over the ice of Kotzebue Sound, miles away from land. Though he himself was badly frostbitten, an' though every one of the herders arrived on the further shore with severe frost-bites, the crossing was achieved, savin' several weeks o' time.

" So, with the deer comin' over the mountains, where they could find moss, an' with the Coast Guard men coming up the coast in the dog teams Bertholf had brought, rescue came up to us on Point Barrow.

" I've seen some strange sights in my time an' I've lived all my life with men who sported with death daily. But I've never seen a stranger sight than strong men creepin' out of the snow-banked hovels where they'd been for four long months, half-starved and three-quarters sick, to actually feel Jarvis to make sure that he was real.

" Many and many a man reckoned it was delirium to think that help had come. It seemed beyond belief. An' when Jarvis told 'em that four hundred reindeer were only a day's journey away, an' that there was fresh meat enough for

all—old seadogs that hadn't had any sort of feeling for years, just broke down and cried like children.

"Then, while the excitement was at its height, and everybody was asking questions at the same time, a grizzled old whaler, who had been whalin' for half a century an' more, I guess, half-blind with scurvy, crept forward and laid his hand on Jarvis' shoulder.

"'Boys,' he said in a quavering voice, 'this ain't just one man, it's the whole United States.'"

CHAPTER VIII

THE BELCHING DEATH OF A VOLCANO

The whaler's story of the great Overland Expedition set Eric questioning about the work of the Coast Guard with the reindeer. He learned that, partly as a result of his handling of the trip, the government had selected Lieutenant Bertholf to make an exploration of northern Siberia for the purpose of importing Tunguse reindeer, which were reported to be bigger and better fitted for Alaska than the Lapp reindeer. He found out how over 200 head of the larger species had been successfully imported, and a couple of days later had a very vivid demonstration of the fact in seeing an Eskimo trot by, riding a Tunguse reindeer like a saddle horse.

The more the boy saw of the Eskimo, too, the more he learned to value their race strength. It was true that they were dirty and that their houses smelt horribly. But, after all, Eric reasoned, it is a little hard to keep the habit of baths in a coun-

try where, during six months in the year, a man would freeze solid in a bath like a fly in a piece of amber. The Eskimo's indifference to smells, moreover, he learned to understand one day, quite suddenly. He was pacing up and down the deck with the whaler a day or two before the *Bear* reached Point Barrow.

"You're always worryin' over those smells," Joey had said to him. "You've lived in a city, haven't you?"

"Nearly all my life," the boy replied.

"Have you ever been in a city what wasn't noisy with street cars, an' wagons, an' automobile horns, an' children playing, an' music-boxes an' pianos goin' an' all the rest of it?"

"It is noisy," Eric admitted, "but you soon get used to that."

"Hearin' is just one o' the five senses, ain't it?"

"Yes."

"An' smellin' is another?"

"Of course."

"Well, an Eskimo's nose gets to be like a city man's ear, one smells all the time an' doesn't notice it, the other hears all the while an' doesn't care. You can't judge a people by its smell. An'

when it comes to fair dealin', you won't find anywhere a squarer people to deal with than the Eskimo. You're Commissioner, ain't you?"

"Yes," the boy answered.

"An' you haven't found much crime, have you, eh?"

"Mighty little," he admitted.

"It's the same every year. They're a fine race, the Eskimo. I'll tell you just one little thing about 'em, that I don't think could be said of any other native race in the whole world."

"What's that?" the boy asked.

"You know," the whaler said, "how natives go to pieces when civilization hits 'em."

"Generally."

"What do you suppose is the reason?"

"Whisky and white men's ways," answered Eric promptly.

"Right, first shot," said the other. "Soon after Alaska was opened up, the Eskimo learned the excitin' effects of whisky. Fearin' trouble, a strict watch was kept on the sale of liquor to the natives, an' as it was easy enough to find out where the whisky had come from an' no vessel could escape from the Arctic without being known, tradin' spirits to the Eskimo soon had to be given up.

SIGNALS THAT GUARDS OUR COAST.
Flags flying at Quogue Station, warning vessels far out to sea.

"But, in order to increase business, the traders taught one old Eskimo chief, named Ah-tung-owra, how to make whisky out of flour and molasses."

"They made it themselves?"

"Yes."

"But where could they get stills? I should think it was as easy to catch a trader selling stills as selling whisky."

"They're home-made stills," the whaler explained. "There ain't much to the apparatus. It is just a five-gallon coal-oil tin, an old gun-barrel an' a wooden tub. The liquor they make tastes like chain lightnin', and makes up in strength what it hasn't got in flavor.

"But what I think wonderful is this. When the Coast Guard—it was the Revenue Cutter Service then—began its patrol of the Arctic, one of the first things it did was to show the Eskimo the result of their drunken bouts. Takin' whisky to native tribes an' then teachin' 'em to let it alone is the white man's long suit.

"But the main difference between the Eskimo an' the rest of 'em, is that these tribes listened. They asked a pile o' questions an' at last agreed that the reasons given were good an' the habit was bad. Off their own bat they broke up all the

stills on the coast, an' months after the clean-up a native told me that he had told his friends inland what Bertholf had said, an' that all the stills there had been destroyed, too. There's liquor enough in the south, but by the Eskimo's own choosin' there isn't a blind tiger to-day between Cape Prince of Wales, Point Barrow and Mackenzie Bay."

In consequence of this self-control on the part of the natives, the young United States Commissioner found very little strain on his judicial powers. One of the things that did trouble him was the constant request of the natives to get married. The problem seemed so difficult that he asked advice from the first lieutenant, who, many years before, had been Commissioner on a similar assignment to that of Eric.

"I don't like marrying these natives, sir," he said, "because, so far as I can make out, they haven't any idea of the legal end of it. I've been talking to Ahyatlogok, a bridegroom, and he really doesn't intend to do anything more than try out the bride for a season, Eskimo fashion, to see if he likes her. And if he doesn't and they both want to separate, if I've married them, they can't."

"Why not?"

"Ahyatlogok's not rich enough to take that long trip to Nome to get a divorce. It's a year's journey, nearly. And unless he does, next time the *Bear* comes up he'll be a criminal. And yet he'll have done just what his father did before him and nearly all his neighbors are doing."

"Mr. Swift," the senior officer answered, with a slight twinkle in his eye, "do you tie a granny knot in a reef-point?"

"No, sir, never!" exclaimed Eric in surprise.

"Why not?"

"Because a granny knot jams, and a reef-point may have to be untied."

"There's your answer," said the first lieutenant, smiling as he turned away.

With these constant small matters and with all the excitements of his trip through the Arctic, Eric's summer passed rapidly. After having touched Point Barrow, the *Bear* came south, landing supplies at Cape Lisburne and returning to Nome. As certain repairs to the machinery were needed, and as her coal bunkers were growing empty, the *Bear* headed to the southward for Unalaska.

The cutter was within half a day's steaming of

the port when the radio began to buzz and buzz loudly, answering the call of a vessel in distress off Chirikof Island. As the steamer was known to be carrying a number of passengers, thus endangered, the *Bear* did not stop at Unalaska, but putting on full speed, arrived off Cape Sarichef Lighthouse at 4 o'clock in the morning, proceeding through Unimak Pass and Inside Passage. The naval radio station from Unalga Island confirmed the report, but could give no further details.

Under full speed the *Bear* reached the scene of the disaster the next day. Of the vessel, *Oregon Queen,* not a sign could be seen, but, save for three persons, all the crew and passengers were safe on Chirikof Island. They were almost without food, however—many of them insufficiently clad and utterly destitute. As the *Oregon Queen* had been bound for St. Paul, Kodiak Island, and a large number of the passengers could depend upon assistance there, the *Bear* picked them up, and the day following, despite extraordinary weather conditions, landed them at St. Paul. Little did the shipwrecked men realize that they had only escaped one danger to be imperilled by another.

"Homer," said Eric to his friend the following

afternoon, as the *Bear* lay outside the barge *St. James* at the wharf at St. Paul, "what do you make of that cloud to the sou'west'ard?"

"Snow," was the terse reply.

"I don't," the boy objected. "It's a mighty queer-looking sort of cloud. It doesn't look a bit like anything I've ever seen before."

"There's lots of things you've never seen," was his friend's reply.

"That's one of them," the boy answered gravely, not at all in his friend's jovial vein. "But I don't think it's snow. There's something awfully queer about it. Gives me the shivers, somehow! It looks too solid for snow!"

Minutes passed. Little by little a curious feeling of unrest began to spread over the ship. The sailors stopped in their work to glance up at the strange and menacing cloud. Its edges were black with an orange fringing, and as clean cut as though it were some gigantic plate being moved across the sky. In the distance there was a low rumble, as of thunder.

The portent rose slowly. Almost an hour passed before the cloud was half-way up the zenith. Shortly before two bells in the first dog watch, Eric, passing his hand along the rail, realized that

it was covered with a fine coat of dust. This was not black, like coal dust, but a light gray.

"Say, Homer," he said, "that's ashes."

"Forest fire somewhere," said the other.

"No," said Eric, "it looks like pumice-stone."

"Volcanic, I'll bet," said the other, with a quickened interest. He scooped up a pinch of the fine dust and looked at it. "It's volcanic, sure enough. There must be a big eruption somewhere!"

"I wish it were right handy near by," said Eric; "I've never seen an eruption."

"You talk as if they were as frequent as moving pictures," said the other. "But there's trouble somewhere, you can lay to that. And it's not far off, either! See, there's another cloud coming up from the nor'ard!"

Steadily, and with a slowness that only increased its threatening aspect, the cloud to the northward joined the vast overhanging canopy that had been seen earlier in the day. By half-past six in the evening it was black as the densest night, the murk only being lighted by the constant flashes of lightning. The air was highly electrified and the wireless was made silent. During the evening the island was shaken by many light earthquake

shocks and several people from St. Paul came to take refuge on the *Bear*. At midnight a fine dust was falling steadily, but by six bells of the middle watch it had lessened and when the sun rose the next morning, he could be seen as a dull red ball. The air was still full of dust and ash, but the eruption was believed to be over.

Early in the morning scores of people came to the ship for drinking-water, many of the streams and wells in the village having been choked. About five inches of ashes had fallen. The captain of the *Bear* started the evaporators going, to provide drinking-water for the folk ashore.

Shortly before noon the ashes began to fall again, even more heavily than before. When Eric came up from below after lunch, the air was so full of a heavy gritty ash that it was impossible to see the length of the ship. The *Bear* was evidently in a place of danger and there was no means of determining what was happening or what would happen.

"Do you suppose we'll strike out to sea?" queried Eric of his friend. "We ought to, for safety, but I don't see how we can leave the place unprotected."

"We'd never do that," replied the other.

"Things don't work out that way in the Coast Guard. You'll see. We'll stick here till the last gun's fired."

It was a relief to Eric when at three o'clock that afternoon he was ordered to accompany a shore party. All hands had been on duty since seven that morning, and when Eric went ashore the sailors were keeping regular shifts with shovels, clearing the decks, while four streams of water from the fire mains were playing incessantly in an effort to clear the ship of its horrible burden.

More than once, when the rain of volcanic débris grew especially heavy, the men fell behind, work as hard as they might. Herein lay real danger, for if the deck-load of ashes grew too heavy the *Bear* might turn turtle. Then all hope of rescue would be lost.

The captain of the *Bear* summoned a meeting of the principal citizens. He sent to the two saloons in the village and finding that they were crowded, requested the proprietors to close. This they did without demur, realizing that at a time of such peculiar danger, when no one knew what had happened, what was happening, or where the next outbreak might come, it was necessary for everybody to be on the alert.

Through the afternoon the darkness increased into a horrid gloom far worse than the darkest night. Men collided with each other working about the decks, for the feeble glow of electric lights and lanterns was deadened by the yellowish compost so that they could not be seen five feet away. When nightfall came, no one knew, it had been scarcely less dark at three o'clock in the afternoon than at midnight. All night long men worked steadily in shifts, clearing away the ash. Ashore the conditions were equally terrifying and all night long the bell of the Russian Church boomed out in the blackness. There were few of its followers who did not grope their way to the building at some time during that awful night.

Sunrise and the coming of daylight passed unseen and unnoticed. Only chronometers and watches served to tell the change from night to day. The three pilots of the place were summoned to discuss the possibility of getting the *Bear* safely out to sea, with all the population of the village on board. As every landmark was obliterated, and as the ship's bow could not be seen from the bridge, not one of the pilots would undertake to con the ship through the narrow channel.

Somewhere the sun was shining, but not a glint

of light passed the impenetrable veil overhead. Still the sailors worked steadily, shoveling off the ash over the vessel's side, still the pumps worked, though now the water brought up from the harbor was like gruel and scarcely could be forced through the pipes. Every few minutes, from the hills around the village, avalanches of ashes could be heard, the terrible clouds of débris flying over the town and adding to the choking smother.

Orders were given for all people to gather on the vessel or the wharf. By ten o'clock the last of the gray ash-covered ghosts was mustered in, 185 people on the vessel, 149 in the warehouse on the wharf. Blinded by ash, with throats so burned by the acrid fumes that even a hoarse whisper was agony, with nostrils bleeding from constant effort to keep them from being clogged with the fine dust, and with a stabbing pain in the lungs with every breath one drew, the people were at the extremity of their endurance. The situation looked desperate both for the residents and for the officers and crew of the Coast Guard cutter.

The officers of the *Bear* worked incessantly. In the dark they were here, there and everywhere, and Eric, filled with the spirit of the service, was on the jump. He was busy in the storehouse

Courtesy of U.S. Coast Guard.

GOING TO PIECES FAST.

Courtesy of U.S. Coast Guard.

"WE SAVED 'EM ALL."

Coast Guard crew (including the dog) which rescued every sailor of wrecked vessel's crew.

shortly before eleven o'clock in the morning when a man groped his way in, saying that he had just escaped an avalanche and that several men were marooned in a steamer lying off the cannery wharf half a mile below the dock. This was Eric's chance. So often had he made the trip from the ship to the storehouse that morning that even in the dark and through the flying spume of yellow horror he made his way direct to the first lieutenant, and saluted.

"Yes, Mr. Swift?"

"I have information, sir," he said, "that there are seven men cut off either in a steamer near the cannery, or in the cannery itself, half a mile below the pier. I am told there is neither food nor water in the building and that it is at the base of a hill from which it may be overwhelmed by an avalanche at any minute. I think, sir, that a party could reach them."

The lieutenant nodded and sought the captain. He returned a few moments later.

"There are high hills between the village and the cannery," he said, "and the road winds along the beach. We have absolutely no means of knowing what the conditions may be. Under the circumstances the captain does not feel justified in

ordering a party on what might prove to be their death. But—"

"Yes, sir?"

"He directed me to say that neither would he feel justified in refusing permission to those who desired to attempt a rescue. If there should be volunteers, I have no doubt that you would be given the opportunity to lead the party."

Eric saluted, though in that dim strange dark he could scarcely see his superior's face, and withdrew. In spite of the unknown nature of the ordeal not a man drew back. Eric chose his friend, Homer, two warrant officers, three enlisted men, one local resident for a guide, and the master of the imperilled steamer.

The road was level, the distance only half a mile, but so great was the danger of ash avalanches that every man was roped to the other—all carried lanterns and there were several shovels.

"Hope we don't get buried under this stuff!" Eric whispered to Homer, as they started out.

"I feel just about buried now," was the hoarse reply.

At the end of the score of houses that made the village street, the party struck a deep drift of the volcanic ash. It took the guide to his waist and he

stumbled and fell. The fine acrid pumice filled his mouth and his nostrils, and when Eric picked him up, he feared the man would strangle to death. A mouthful of fresh air would have meant much to the sufferer, but there was nothing but the sulphur-laden atmosphere to breathe. In a minute or two, however, choking and gasping, the guide cleared his nasal passages and throat of the burning dust. Blinded and staggering, he recovered enough to be able to walk, but Eric took his place and led the way.

Warned by this accident, which had so nearly proved a fatality, the boy proceeded with extreme caution, digging a shovel before him every step to make sure that the ashes did not hide some newly opened earthquake crevice into which the party might fall. Under the slope of the mountainous shores the swirling spume of gray-yellow dust was so dense and yet so light in weight that the men struggled in ashes to their waists, and it was hard to tell where earth ended and air began. It was as though the earth had no surface. Unconsciously Eric found himself using the motions of swimming, in order to cleave his way through the semi-solid dust.

Suddenly, as Eric prodded the ground before

him, the shovel went through with a jolt, almost precipitating the boy on his face. Had it not been for the slowness and the care with which he was advancing, he might have had the same fate as the guide. Lifting up the spade, what was his horror to find that it was wet!

With quick alarm Eric realized that the rescue party was in the utmost peril. They had wandered from the shore and were in very truth within a few inches of disaster. They were walking on the sea! The layer of floating ash, though several feet thick, was but a treacherous surface which might break through at any moment and land them in the water below. There, certain death awaited them, for they would smother and drown under the hideous pall. With his heart in his throat Eric turned sharply to the right, trusting only to a vague sense of direction. A score of steps brought him to a slight billowing of the ash, and with a sigh of relief he knew he was on solid ground again.

The danger was little less upon the shore. Huge avalanches could be heard hurtling down the mountain-side and with each new slide the air became, if possible, more unbreathable than before. A new fear possessed the lad. It might be

that they would return alive to the ship, but might not every member of the party be made helpless for life by the clogging of the lung-passages with dust?

Presently he felt a tug at the line which roped the members of the party together, and he stopped.

"What's the trouble?" he passed back word.

"Duncan's gone under, sir."

Eric made an uncomplimentary reference to Duncan under his breath, then questioned,

"Unconscious?"

Came back the answer,

"Yes, sir; completely collapsed."

The boy was puzzled what to do. He could detach two members of the party to carry back the unconscious sailor, but that would reduce his strength from eight men to five. He could not leave the man alone, for if he lay on the ground for even ten minutes, he would be covered with volcanic ash and could never be found again.

"The two men nearest on the line pick Duncan up and bring him along," he ordered, and the party proceeded.

They had covered another hundred yards, when overhead they heard a fearful roar. In the murk and blinding confusion no one could tell what new

peril was threatening, but a piece of pumice almost the size of an apple came whistling down, midway of the party. One of the sailors, with great presence of mind, whipped out his sheath knife and cut the rope, shouting,

"Forward! Quick as you can!" then doubled on those behind him, crying, "Back! Back!"

He was not a moment too soon, for full between the two halves of the party came a pouring torrent of ash. Its greasy and slippery character made it flow almost like water, though sending up clouds of dust. Choking and blinded, the rear members of the party gave back. While they waited, not knowing whether the whole mountain side might not plunge down upon them, Duncan gasped and came to.

Meantime, Eric passed back word to see how the rest of the party had fared. What was his horror to hear, from the fourth man in the line,

"No one back o' me, sir. An' the line's been cut through. Not broken, sir; cut clean!"

"Right about and go back," ordered Eric. "We've got to find the rest of them!"

"Beg your pardon, sir, but I can't."

"Why not?"

"There's a Niagerer of stuff comin' down the

mounting, sir, and no one could stand up agin it for a minnit."

"Shout, then, and try if you can hear the others."

The sailor shouted, and then called to Eric,

"Yes, sir, there's an answerin' hail." Then, a moment later, "They say everything's all right. Four of them's there, sir, and Duncan's come around."

The rushing "whoosh" of the ash-slide began to lessen, and presently, gallantly plowing through the still sliding pumice, came the first sailor. The rope was knotted and the party went on. A quarter of an hour later they reached the cannery. The *Redondo* was lying anchored off the cannery wharf and Eric managed to attract the attention of the crew and get them to launch their boat. The boat pulled in as close to the beach as possible, until it was fast in the ash, then a line was thrown to the shore and the boat pulled in, though the last fifteen feet were like thick porridge. The seven men were brought along the beach and returned to the vessel. Not a sign remained of the trail the party had made on its outward trip.

It had taken three hours for the rescue, and as soon as the eight men reached the vessel, they gave

way. Even Eric was compelled to put himself in the hands of the ship's surgeon. The doctors, one from the ship and one from the village, had been working night and day. Hollow-eyed and unsleeping, they continued their task of reviving people suffocated by the fumes or strangled with ashes. More than one worker had collapsed utterly as the result of an unceasing fight against the volcanic fiery rain.

In the afternoon of that third day the sky began to clear and by three o'clock objects became dimly visible. Absolute dark gave place to an orange-brown light, under which, every object, cloaked in a mask of ashes, looked horribly unfamiliar. It was like waking into a new world where nothing would ever be the same.

The slight tremblings of the earth increased, and almost at the same time as the clearing of the sky, there was a serious shake. On board the *Bear* the trouble was not so noticeable, but ashore the occupants of the storehouse fled in terror, crying that the building would fall on them. Their fears were not without justification, for the big frame building creaked and swayed in an alarming manner.

This decided the matter. Every one was some-

how stowed on board the *Bear* and at slow speed, only enough to give steerage way, with two leads going, and the oldest and most experienced pilot in the bow to con her through the narrow channel, the cutter made her way out safely. She anchored in the outer harbor, fortunately having secured a bearing from Woody Island, whereby she could run out to sea by compass course should conditions warrant. This also gave an opportunity to relieve the suffering on Woody Island, and 104 persons were brought on board, making 486 people to be fed from the supplies handled by the *Bear*. It was incredible how so many could be accommodated, but the organization was perfect.

The night was spent in great suspense, but Eric, who had been relieved from duty, slept through it. It was noon before he finally wakened, to find a bright sunlit sky and a ship clear of ashes. In the afternoon, as the effects of the eruption cleared away, three expeditions were sent to Woody Island, to St. Paul, and to the neighboring islands. Eric was sent with the *Redondo* on the rescue party that was headed for Afognak.

There it was learned that the eruption had come from Mount Katmai, on the mainland of the Alaska Peninsula, opposite Kodiak Island, and

that there were people in distress in the region of the volcano. Without an instant's delay the *Redondo* was headed out of the harbor, and despite a dense fog, she was run through the Kupreanoff Straits and across Shelikoff Straits to Kaflia Bay.

At half-past two in the morning, the *Redondo* dropped anchor near the volcano, and as soon as it grew light, Eric was sent to head a landing party. Every hut was covered with ashes, and a native, pointing to one of the drifts, said it was as high as "five houses," or about fifty feet high. All the streams were buried; there was not a drop of liquid of any kind, and the villagers had lived in the tortures of that ash-choked air for three days, waterless. Two were delirious from thirst, all were at the point of exhaustion when the Coast Guard men appeared to save them.

With her engines throbbing at their utmost speed, the *Redondo* passed from point to point of the stricken coast, saving over fourscore lives that a half a day's delay would have rendered too late to save. When the dusk of that day deepened into evening, the *Redondo* turned homeward from those shrouded shores, bearing to safety the homeless victims of the peninsula and islands close at hand.

Courtesy of U.S. Coast Guard.

NATIVE REFUGEES FROM KATMAI ERUPTION.

From waterless shores covered six feet deep with orange-grey dust, come famishing fishers in their kayaks.

Still in the far distance rumbled the defeated earthquake, still upon the sky was reflected the lurid glow of the volcano, which, through the daring and the courage of the Coast Guard men, claimed not a single victim.

CHAPTER IX

DEFYING THE TEMPEST'S VIOLENCE

"I've been wondering," said Eric to Homer, a few days after his rescue trip on the *Redondo,* "what we're going to do with all these natives. We can't take them back to the Katmai country. They just about live on fish and everything that swims was killed during the eruption. How are they going to exist? It'll be years before the fish come back."

"I can tell you all about that," his friend replied. "You know the commanding officer of the Bering Sea fleet came up, while you were away?"

"Yes, you told me."

"I heard all about the plans which the department had approved, on his suggestion. A new village is going to be built at the place which the Coast Guard picks out along the shore as being the best site for a town. It's going to be a regularly laid out place, with sanitary arrangements and everything else complete."

"Give them all a new start, eh?"

"That's it, exactly. One of the other ships of the fleet is cruising now along the coast to pick out the best spot. We're to send a carpenter ashore there and leave him for the winter to look after the erection of igloos. He'll be in charge of enough supplies to last the settlement till spring."

"Whereabouts is this town going to be?" asked the boy.

"It's not definitely decided yet," was the reply, "but probably it'll be on Stepnovak Bay. It'll be quite a place, too, because it'll start out with a population of over 500 natives, maybe a thousand."

"That's a metropolis for Alaska," agreed Eric.

"And, what's more," continued the young engineer, "they're going to give the new town the name of 'Perry,' in honor of our skipper, as the department said, for 'recognition of his heroic services at the time of the eruption.'"

As soon as arrangements for the wintering of the homeless natives had been completed, the *Bear* returned to Unalaska and thence made one more trip to Nome on business connected with the Federal Courts at that place. Then, as winter was closing in, the Coast Guard cutter stood out to sea up toward the Bering Straits, to await the

outcoming of the several vessels in the whaling fleet, and make sure of the safety of every American sailor in the Arctic. The last of the whalers cleared the straits on October 29, and on the following day the *Bear* started on her southerly course, leaving the Arctic to its annual eight months of unvisited silence.

Eric had wondered a good deal what assignment or appointment he would get for the winter. Great was his delight to find that both he and his chum had been assigned to the *Miami,* and were to report for duty on December tenth. The extra couple of days allowed him on the journey across the continent gave the boy a chance to visit his relatives in San Francisco, and he also managed it so that he took a short run up to Detroit to see his family and to have a chat with his old friend, the puzzle-maker.

He found the *Miami* to be a beauty. Unlike the *Bear,* which depended as much on sails as on steam, the *Miami* was well-engined. Almost the first thing that struck Eric when he came to go over her arrangements was her unusually large coal and water capacity.

"No wonder she can stay out for months at a time on ice patrol, or chasing up a derelict," said

Eric; "she's got coal enough for a trip around the world!"

"Wouldn't mind if she was going to," said Homer, with a grin.

Eric shook his head.

"Not for mine," he answered; "I've a notion there's enough going on right around here. Anyhow, the Gulf of Mexico will feel good after a norther like this," and he shivered in his uniform, for the wind was nipping.

"How would it feel to be somewhere around Point Barrow now?" his friend suggested.

"It might be all right if a fellow were used to it, and dressed for it. At that, I don't believe I'd want to put in a whole winter up in that country. It isn't so much the actual cold I'd hate as it would be having to stay indoors half the time because it was too cold to go outside." He sniffed the salt air. "Guess my folks have been sea-dogs too many hundred years for me to cotton to anything that means indoors."

"Me, too," said his chum. "From what I know about the *Miami,* what's more, I don't believe we're going to spend too much time ashore. When are we sailing, have you heard?"

"Day after to-morrow, I believe," Eric re-

plied. "We're going right down to our southern station."

"The Gulf?"

"Yes, and Florida waters as far north as Fernandina," was the answer.

"The sooner the quicker, so far as I'm concerned," said the other, as they strolled below.

Two days later the *Miami* was steaming down Chesapeake Bay. The weather was ugly and there was a little cross-current that kept the cutter dancing. Eric had his sea legs, after his summer on the *Bear,* but he was surprised to find how different was the motion of a steamer and a sailing ship. The other junior lieutenant, whom he had already come to like rather well, laughed as Eric stumbled at a particularly vicious roll.

"This isn't anything," he said. "Wait until we strike the edge of the Gulf Stream. Then she's apt to kick up her heels a bit. And you ought to see the *Yamacraw!* She's got any of these modern dances pushed off the map!"

"I don't mind it," Eric answered, "only it's a different kind of roll. I'm just off the *Bear.* She rolls enough, but it's a longer sort of roll, not short jerks like this."

"Of course," said the other, nodding; "bound

to be. A ship under sail is more or less heeled over and she's kept steady by the pressure of the wind on the sail. The long roll you're talking about isn't the sea, but the gustiness of the wind. That's what makes the long roll."

"At that," said Eric, "it seems to me that the *Miami's* pretty lively now for all the sea there is."

"There's more sea than you'd reckon," was the reply. "Chesapeake Bay can kick up some pretty didoes when in the mood. You'd never believe how suddenly a storm can strike, nor how much trouble it can make. You see that skeleton lighthouse over there?"

"Yes," said the boy. "Smith's Point, isn't it? I remember learning all these lights by heart," and he rattled off a string of names, being the lights down Chesapeake Bay.

"I see you haven't forgotten the Academy yet," said the other. "Yes, that's Smith's Point Tower. And while it's not a particularly imposing looking sort of building, it's a very important light. It was when they came to build that light, they found out what Chesapeake Bay can be like. Aside from some of the really big lighthouses like Minot's Ledge, Smith's Point gave as much trou-

ble to build as any lighthouse on the United States coast."

"Why?"

"Bad weather and natural difficulties," said the other. "My father was the designer, and because Mother was dead, Father and I used to be together all the time. I was a small shaver of twelve years of age at the time so I was right in the thick of it."

"Tell the yarn," pleaded Eric.

The lieutenant smiled at the boy's eagerness, but filled his pipe and began.

"Right opposite Smith's Point," he said, "on the Virginia shore, the tides and currents at the mouth of the Potomac River and at the entrance of Chesapeake Bay have built out a shoal which, if you remember your chart, you will recall juts out in the bay over nine miles from the land. The same tides had scoured Smith's Island on the other hand—port side going out of the bay, but there are some nasty rocks in the channel. It's a tricky spot, that Smith's Point Shoal, and many a good vessel has gone to pieces on it.

"It was the wreck of the barque *Mary Louise* that drew public attention to Smith's Point. She struck the shoal and went down with all hands.

Less than two hours after she sank, a steamer came along and hit the wreckage. The steamer was so badly injured that it was only by a good deal of luck and clever handling that her captain succeeded in beaching her and saving all the passengers. The Lighthouse Board had made several recommendations for the erection of a lighthouse at that point, and when public attention had been focussed to this danger by the disaster, it was easy enough to get the appropriation through Congress. So the money was set aside and Father was given the contract of designing and erecting the lighthouse.

" By the end of the next month a huge unwieldly foundation caisson was on the ways at a shipyard in Baltimore. I was just a kid at the time, but the queer shape of this interested me right from the start. It was like a bottomless box, thirty-two feet square on the inside and twelve feet high. It was so thick that a tall man could lie down crosswise on one of the walls and stretch out his arms to the full, and then there would be several inches beyond the tips of his fingers and the ends of his feet."

" My word," said Eric, " it must have had some timber in it! "

"It had a lot of weight to support," said the other. "After a while, it was launched—I was there—and dropped into the bay near Sparrow's Point. On it were built the first two courses of the iron cylinder which was to be the lower part of the lighthouse. Although that wooden caisson weighed over a hundred tons, so heavy and solid was the cylinder that it sank the wooden structure out of sight."

"How big was the cylinder?" queried the boy.

"It was thirty feet in diameter and each of the courses was six feet high. That's twelve feet for the two courses. Inside the big cylinder was a second smaller one, like an air-shaft, five feet in diameter. A pump was rigged on the edge of the cylinder for the journey down the bay, in case any water should splash over the sides from the wake of the tug.

"When the springtime came and there was a reasonable prospect of fair weather, quite a fleet set out for Baltimore with Father and me in the leading tug. I felt as proud of myself as if I'd been an admiral! I wasn't quite sure," he added, laughing, "whether Father was the boss of the job or whether I was, myself.

"We had a large ocean-going tug towing the

caisson, but we went ahead at very slow speed. Besides the big tug there were two tugs towing seven barges with the iron work, with building materials, stone, cement, and all that sort of thing. It made quite a gallant show.

"I want to tell you right now, we missed our guess when we supposed that Chesapeake Bay was being coddled by any of the softening influences of the gentle springtime! It was only lying low! It took us three days to get to the site of the lighthouse, which was marked by a buoy. We reached there on a quiet and peaceful evening, the sort that landlubber poets write about. A little after sundown it began to breeze up, and by four bells of the first watch, there was a stiffish wind, which at midnight began to climb into half a gale.

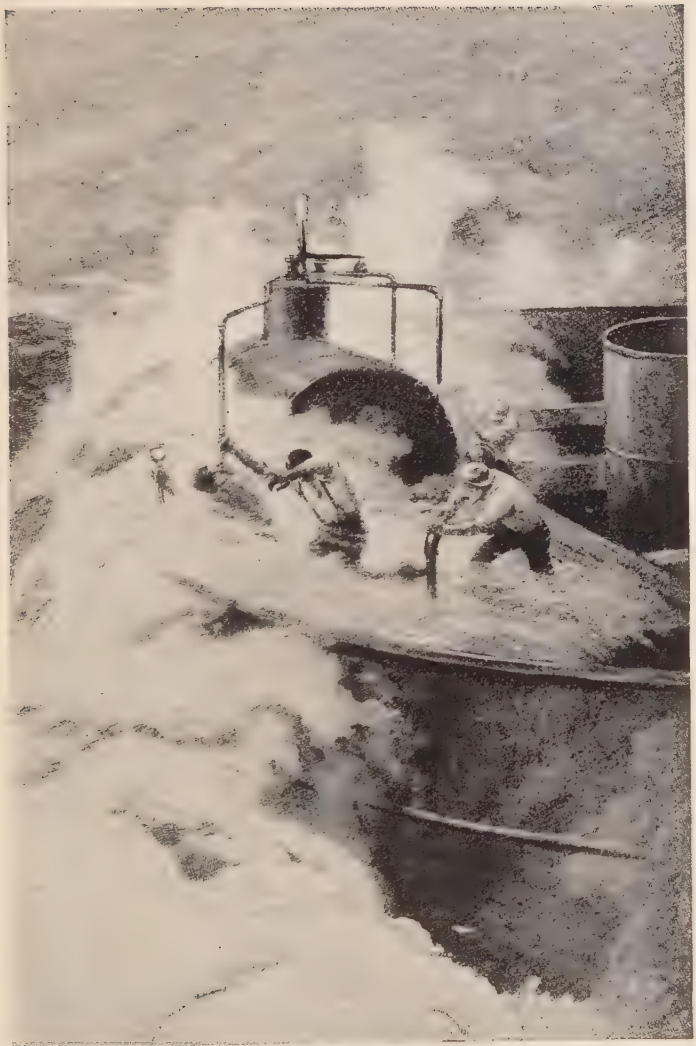
"Then the sea began to rise. It only takes a capful of wind to make things nasty on the bay, and that iron cylinder began to toss like a cork. We'd left four men aboard the cylinder and by half an hour after midnight they were pumping for their lives. There was a big searchlight on the tug and Father came tumbling up from below and ordered the searchlight turned on to the cylinder.

"I tell you, that was a sight. There was nothing to be seen in the smother but the great black

iron rim rolling savagely, the white water spouting about it, and, as it heaved above the waves, the searchlight showed its black sides with the water streaming down. There, clustered at the pumps, were the four men, working like a bunch of madmen and shouting for help as the cylinder rose above the water, strangling and clinging to the pump-handles like grim death as she went under. It was for their lives that they were working, for if ever half a dozen tons of water should slop over the side of the black monster, it would sink straight to the bottom, and so great would be the suction that there was not the slightest chance that any of them would ever come up alive.

" That was one time I saw Father in action. He yelled for the lifeboat and got volunteers. Out of the blank confusion he brought order, and in less than two minutes the lifeboat was over the side with twelve men aboard, Father one of them. The little boat rose on the waves like a feather and the third wave dashed it against the rim of the cylinder. As the frail craft crushed like an eggshell, every man leaped for the edge, hanging on to the sharp iron edge like grim death.

" Down came the cylinder again and as she careened, every man clambered on. The added



Courtesy of McClure's Magazine.

"THE IRON RIM ROLLING SAVAGELY."

The cylinder of the Smith's Point Lighthouse caught in a storm while being towed down Chesapeake Bay.

weight made her top-heavy and she began to ship water badly. Four of the fresh men were put at the pumps to relieve the others who were exhausted by their efforts.

" Father had climbed on the cylinder, with a rope slung over his shoulders. He called to the men to haul in. At the end of it was a large piece of canvas, an old sail. With nothing to which they could hold on, with the waves dashing high and that great iron drum reeling drunkenly on the sea, those men lay flat on their stomachs and spread that sail over the top of the cylinder. More than once it seemed as though wind and sea would get under that sail and with one vast heave, pitch every man into the sea, but they held on. One of the men, an old time shellback, bent that sail on to the cylinder so snugly and cleverly that almost two-thirds of the surface was protected. With teeth as well as hands the men held on, and lashed the canvas into place.

" Every second they expected to feel the cylinder founder beneath their feet, for though the pumps were going steadily and furiously, more water was being shipped than could be taken out. Once the sail was lashed fast, however, the cylinder shed most of the wash and the pumps, now

working at top speed with eight men at the handles, began to gain. Water still scuttled down the iron sides, and as the sea was rising, she put her whole side under for the fraction of a second, twice. I was watching it all from the steamer, our searchlight playing full on the ungainly craft.

" Presently, so perilous did the situation grow and so rough the sea, that the captain of the steamer signaled to one of the smaller tugs to take up her anchor and stand by to pick up survivors should the cylinder founder. He broke away his anchor himself and the big ocean-going tug steamed to windward of the cylinder, letting down a heavy coat of oil on the sea. It worked like a charm. The smoothening effect of the oil was just sufficient to enable the men to work on the cylinder with a slight, a very slight, margin of safety.

" Six men scuttled down the rope ladders on the inside of the cylinder. It chanced that there were four buckets on the iron drum and with this they organized a bucket brigade. The water was still three feet deep and swishing about like a whirlpool. Every man knew that one large wave would send them to Davy Jones' locker.

" Down in the bowels of that iron cylinder they toiled. Not a gleam of light was anywhere, the white shaft of the searchlight overhead only making the shadows denser. No man could see his fellow; only by feeling were the buckets passed from hand to hand. But, between the bucket brigade and the pumps, little by little the water lessened, the load of the cylinder lightened and she rode higher in the water. Little choice was theirs, either to bail unceasingly or to drown like rats in a hole.

" Daybreak found them still at work, spent with exhaustion, hollow-eyed and suffering from the night of terrible strain. The wind had dropped a little with the dawn, but the sea still ran high. Seeing that the men were too thoroughly wearied out to be of any use, even though the weather should improve rapidly, Father gave the order for the fleet to run to the nearest shelter. We sought the lee of Smith's Island, off the Maryland Shore, and stayed there for a week.

" At last, with every one rested and eager for another tussle, the fleet crept out again. All the weather indications were favorable, and, so far as the experts could foretell, there wasn't a storm in sight for a week or more."

"Weather experts aren't much on guessing," commented Eric.

"Not in Chesapeake Bay, anyhow," the other rejoined.

"Not anywhere!"

"I wouldn't go so far as that," the other answered. "There'd be a lot more wrecks than there are if it weren't for the storm signals of the Weather Bureau. They can always warn ships of the coming of a big storm, one of these West Indian hurricanes, for instance. Squalls, of course, they can't foresee. Usually, that doesn't matter, because no seaworthy vessel is going to be worried by a squall. But that iron cylinder wasn't seaworthy. At least, you should have heard what the men called it who had been on board the night it nearly went down!"

"I can imagine," said Eric.

"Then you've a healthy imagination," his friend replied grimly. "As I was saying," he continued, "the fleet started out under sunny skies and a smooth sea. They reached the place where the buoy was moored and Father took very careful observations to make sure that the buoy had not shifted during the storm. Everything was all right, and the instant the cylinder was im-

mediately over the precise spot, the valves were opened and the water began to pour in.

"The tugs at once brought up the two barges containing heavy blocks of stone, and the instant that the cylinder touched the bottom, the gangs of men started to heave the stones overboard."

"What in the wide world was that for?"

"To prevent the water from scouring away the sand. You see it's all sand there, that's why the caisson was made. As soon as the current would strike an obstruction like the cylinder, it would make a gyratory sweep around its base. With the strong tides of Chesapeake Bay, even an hour would be enough to scoop out the sand and plunge the whole structure edgewise into the sea. So overboard the stones went, all round the cylinder, making a rough protecting wall against the undermining force of the water. The swirl, instead of striking the smooth iron side of the cylinder, would be broken against the pile of rocks. Moreover, with the sand thus protected it could not be washed away so easily by the force of the current.

"At the same time, another gang of men was sent aboard the cylinder, and one of the smaller tugs brought up a barge loaded with concrete. The men tumbled into the compartments of the

cylinder. From the barge two pipes were thrust. Down one of these poured a steady stream of cement, from the other a torrent of small grit, while an unceasing cataract of salt water rushed down from the pumps of the steamer.

"In this awful mess of cement, water, and small stones the men wallowed and struggled, mixing the concrete and packing it down hard into place. Wet to the skin, covered with cement dust, it was all that they could do to keep from turning into concrete statues, and the foreman was continually advising the men to put hands and faces directly under the stream of water and not to give the cement dust a chance to harden on their faces. For two hours they slaved, working in a frenzy of haste.

"Then, when everything was proceeding so well and so rapidly, a black storm-cloud came up out of the sea to the southeast, and the waves began to roll in. The whistle for recall blew shrilly. Up from the cylinder poured the shovelers, covered with concrete and looking like gray images of men. There was a wild flight for the steamer. One of the barges snapped a hawser and it was only by the herculean efforts of the smaller tug that she was kept from collision with the cylinder.

Had that tug, loaded down with building material, ever canted against the cylinder, the whole effort would have been in vain.

" One of the lifeboats, containing sixteen men, was picked up by a wave and thrown against the iron rim as a child throws a ball. The boat went into matchwood and every one of the sixteen men was thrown into the water. But Father had taken the precaution of not engaging any man who was not a good swimmer, and the other tug had received instructions to follow each boatload of workmen every trip they took. Accordingly, when the men were thrown into the sea, the tug was not twenty yards away and every one was picked up without injury.

" The next morning, to the horror of every man in the fleet, the cylinder was seen to be inclining four feet from the perpendicular. Although the waves were running high, a gang was sent on one of the stone barges and another two hundred tons of stone were thrown off on the side to which the cylinder was inclining."

" Why? " asked Eric. " I should have thought that it ought to be on the other side."

" Not at all," his friend rejoined. " The reason that the cylinder had listed was because there

had been some scouring away of the sand in spite of the stones. If, therefore, the stones were put on the side from which the sand had already been cut away, the action of the water on the other side would undermine the sand there and gradually straighten up the cylinder. At least, that was the idea."

"And did it work?"

"Perfectly. Two days passed before the cylinder was absolutely level, and in the meantime the tug had taken one of the barges for more stone. Another hundred tons was dumped down as soon as the cylinder was straight again, and it was thereby kept from further scouring. The weather had become good again, and the concrete work was continued. On April 21st the entire gang began work. Barge hands, cooks, everybody that could handle a shovel at all, was sent aboard the cylinder."

"Did you go?"

"You bet I did, and I worked as hard as any of the men—for a while. Two or three hours of it did me up, though. I was only twelve years old, remember, but most of the men kept on the job for forty-eight hours straight with only fifteen minutes allowed for meals. By that time the

foundation was secure with thirty feet of solid concrete twenty-two feet thick.''

'' That ought to hold it,'' said Eric.

'' That was only the beginning,'' said his friend. '' What would hold it, resting on the top of the sand? ''

'' I'd thought of that,'' admitted the boy, '' but I supposed the weight would be enough to drive it in.''

'' Never,'' the other said. '' The next step was to drive it down into the hard sand at the bottom of the bay. Father had made borings and found a true sea-bottom sand fifteen feet and a half below the level of the shoal. It was to that depth that the whole caisson had to be sunk.

'' You remember that I told you there was an air-shaft in the middle of the caisson? ''

'' Yes.''

'' Well, on the top of this air-shaft an air-lock was built. The water in the air-shaft was forced out by compressed air and the men entered the caisson.''

'' Into the compressed air? ''

'' Yes. It takes a special kind of worker for the job. In the air-lock, you know, the men have to stay for a while before they enter the chamber, so

as to get used to the compressed air gradually. Lots of people can't stand it."

"Did you try it?"

"Yes. I asked Father and he wouldn't let me. But I slipped into the air-lock once and tried it, anyhow."

"Well?"

"Not for me!" said his friend. "I got out in less than five minutes. My head seemed bursting, and I was bleeding from the ears as well as the nose. But some of them, especially an old chap called Griffin, the foreman, didn't seem to mind it at all.

"As soon as the caisson was clear of water and the men were ready, they entered the caisson, crawled down the long ladder and began to dig away the sand. A large four-inch pipe led up the air-shaft and over the sea. The sand and small stones were shoveled into a chamber from which a valve opened into the pipe and the compressed air drove up the sand and stones like a volcano into the sea. The work proceeded rapidly and without a hitch until the caisson had been sunk thirteen feet and a half. Then, when only two feet from the total desired depth, an unexpected and terrible thing happened.

Courtesy of McClure's Magazine.

"THE BOAT WENT INTO MATCHWOOD."

A sudden tempest breaking upon Smith's Point Lighthouse in the early stages of its construction.

"At three o'clock in the afternoon a low hissing was heard in the caisson, and with a quick flicker the candles first burned low, then flamed anew, the color of the flame a lambent green. For a few moments none of the men realized what had happened, and stood there, stupefied and staggering. An acrid burning sensation gripped the men by the throat and they were stricken blind. Suffering terrible agony, every man managed to climb the long ladder, each step of which seemed an eternity, and entered the air-lock. Ten hale and hearty men had entered the caisson, ten wrecks emerged, the flesh of the inside of their throats raw and their eyes swollen and reddened beyond recognition.

"A telegram was sent to the Lighthouse Inspector of the district, and the doctor attached to the building party sent for medical help. Next day the inspector came down, with assistants, and accompanied by another physician and a nurse. They found that the caisson workers had tapped a vein of sulphuretted hydrogen, probably due to the decay of some deep beds of vegetable matter, such as sea-weed. One of the assistants to the inspector, who was a clever young scientist, suggested that after a day or two it might be possible to enter the caisson again, but that it would be neces-

sary to proceed with extreme care, as another pocket might be tapped, with a recurrence of the danger.

" Although before them, in their bunks, lay their ten comrades, when Father called for volunteers, fourteen men came forward. They knew, they could not help knowing, that they were not only going into possible danger, but into absolutely certain torture. Their comrades lay there—it was not certain that some of them would ever see again, it was not certain that some of them would recover. Absolute agony of the most horrible kind awaited them. But the lighthouse had to be built. It is easy to make a problematic sacrifice of life, it is hard to walk without shrinking into a chamber of awful pain. From this ordeal these fourteen men did not shrink.

" They were headed by Griffin, the old caisson foreman, who had a record of having withstood the greatest pressure possible, a pressure of eight and a half atmospheres. They went down at nine o'clock in the morning. The pain must have been fearful, but they stuck to it to the end. One man went through the air-lock and got food, returning to his comrades. He had been down four hours,

and his condition was so terrible that the doctor ordered him to stay out of the lock.

" ' I'm not that breed,' he said in a horrid whisper over his raw and swollen throat, ' I'm goin' to see it through.'

" ' Better keep away, my man,' the doctor said; ' I won't answer for what will happen to you if you go back.'

" ' I ain't no quitter,' was the answer. ' I'm a Boston wharf-rat, I am, an' I stays wid de gang! '

" That doesn't sound like a heroic speech, Eric," said the first lieutenant, " but it looks to me like it's the real stuff."

" It surely is," agreed the boy.

" He went back with a bite of food for all the men below and they worked on steadily. By the way the stuff came up the pipe they must have worked like demons. Every ear was keen for sign or sound of trouble, but the afternoon wore on, the sand came hurtling from the pipe and the caisson sank lower and lower.

" ' How much further?' I asked Father, just as the evening was beginning to draw in.

" ' Not more than an inch or two,' he said tri-

umphantly. 'I tell you what, I envy those fellows down there. They're real men. I doubt if I'd have the nerve to do it myself.'

"Suddenly there came a muffled roar below.

"'There it is!' cried the young scientist, and he made a bolt for the air-lock.

"Father was not more than a second behind him, waiting only to make sure of the point to which the structure had been sunk. The caisson was within three quarters of an inch of the required depth!

"Meantime, down in the caisson, the feared disaster had occurred. The gas had come up with a rush, almost like an explosion. In the green glare of the candles, burning sulphur and hydrogen flames instead of oxygen, the men were staggering, here and there, unable to find the way out.

"Griffin took charge. It was his hand that led every man to the ladder. Nine men crawled up.

"As the minutes passed, the anxiety at the head of the shaft grew intense. No more workers came. Fourteen men had gone down; only nine had returned. There were then five men still unaccounted for. First one rope was dropped without result, then another. This time some groping hand—it proved to be Griffin's—encountered the

rope, and found a sufferer. He tied the rope around his comrade and the man was hoisted up. Four times this was done, but the fourth was a huge, powerful Irishman, called Howard. When he was pulled up, entirely unconscious, he stuck fast in the hole and could not be pulled out.

" By an exertion of self-control and endurance, that no one ever has been able to understand, Griffin climbed that ladder into the top where the gases were at their foulest. Though all his comrades had been too far gone for several minutes to move, even to help themselves, he succeeded in pushing and pulling Howard's unconscious body until it passed through the hole.

" A hand was stretched down to reach Griffin and bring him to life and safety, when the overwrought system gave way. He loosed his handhold on the ladder and fell.

" A groan went up from those above. It was a thirty-foot fall. Had the rescuer, the hero, been killed? Scarcely could a man fall in such a way in an air shaft and live.

" There was no need to ask for volunteers. Two men, one of those who had been in the caisson all day and was one of the first rescued, and another, who had not gone down at all, leaped for the lad-

der. The doctor caught the first by the shoulder and thrust him aside. The other descended a few feet and then came up again, to fall unconscious at the edge of the shaft. Another sprang forward, and yet another, clamoring for leave to go down.

"Just at that moment there was a faint tug at the rope, the first rope, which had been left hanging down in the pit. Hardly expecting anything, one of the men started to haul it in.

"'Come here, boys,' he cried; 'Griffin's on!'

"With their hearts in their mouths, the men hauled in, and the limp and apparently lifeless body of the foreman came to the surface. How he had ever managed to fasten the rope around him was a mystery. His hands, with the flesh rubbed from them to the bone, showed that when he had lost hold on the ladder he had still retained presence of mind enough to grasp the sides and had slid to the foot. There he had found the end of the rope hanging and in a last flicker of understanding had tied it around himself."

"Did he get all right again?" asked Eric eagerly.

"He was blind for six weeks, but finally recovered. Two of the men were seven months in hospital, and one became permanently insane. Four

got ' bends,' that fearful disease that strikes caisson-workers, but happily, none died from the terrible experience."

" And the three quarters of an inch still lacking? "

" The cylinder settled just that much and no one ever had to go down the shaft again. The caisson was filled with concrete and the air-shaft sealed."

" And that was the final effort of the sea? "

" Not quite. A month later a storm came up and drove the steamer against the cylinder with such force that eight of the plates—though an inch thick and braced with rigid solidity—were crushed in. Father had taken precautions against such an accident by having had a number of extra plates made, and the lighthouse was finished and turned over to the government three days before the expiration of the time required by the contract. It was a case of man's struggle with the elements, and man won."

" But the honors are with the caisson-men," suggested Eric.

" Yes," agreed the other, " the hero of Smith's Point lighthouse is Griffin, the caisson-man."

CHAPTER X

ADRIFT ON A DERELICT

"Looks to me as though we're going to have a ripsnorter for Christmas," said Eric to his friend, Homer, the day before the festive season. "If the sea gets much higher, Cookie won't have to stir the plum duff at all!"

"How's that?"

"All he's got to do is to leave the raisins and the flour and the currants and whatever else goes into the duff lying loose on a table. The old lady is kicking loose enough to mix it up all right. Doesn't she pitch!"

"Great cook you'd make," laughed the other. "I'm glad we don't have to mess from your galley. But you're right about the weather. It's all right to go hunting for derelicts, but I don't know how the deuce anybody can be expected to find one in a sea like this!"

"We might hit her," suggested Eric, cheerfully.

"You're a hopeful prophet, you are," retorted his chum. "I'm not aching to feed the fishes yet awhile."

"Well, we might bump, just the same. Then the *Seminole* would have a chance to hunt us as a derelict, and Van Sluyd—he's on her now, you know—would have the time of his young life."

"I don't think you need to worry about sending a message to Van Sluyd yet awhile," the other answered; "after all, the *Miami* is still above water."

"She is, once in a while," Eric commented, as the cutter "took it green" and the water came flooding down the deck. Homer, seeing the wave coming, scuttled for the companion hatchway and went below.

As Eric had said, it seemed difficult to try to locate a derelict in a half a gale of wind. Yet, so dangerous to navigation was the floating wreck which the *Miami* was seeking, that the risk was worth taking. When he remembered what the lieutenant of the *Bear* had said to him once about derelicts, he realized the terrible importance of the quest.

"Every year," he had said, "hundreds of vessels, both sail and steam, leave their home ports

for foreign shores, or start from foreign ports for home. The day of the expected arrival comes and goes, two or three days drag by, and still there is no sign of them. Anxious relatives and friends besiege the shipping offices daily for word, and no word comes. When suspense has passed into assured disaster, the underwriters inscribe against that vessel's name the one word, "Missing!" An average of a vessel a day is the toll of the Seven Seas upon the world's shipping. And the principal cause is—derelicts."

As the *Miami* plowed her way through the water, dipping her nose into the waves raised by a stiff southeaster, Eric thought of the suddenness of the catastrophe if the Coast Guard cutter, in the darkness, should strike one of those abandoned hulks, floating almost level with the water, and scarcely visible from the vessel's decks.

It was a night calculated to shake the nerve of a youngster who knew that this deadly menace to the life of every one on board might be suddenly lurking in the trough of any one of the waves, that came shouldering their vengeful resentment against the sturdy little vessel that defied them. They had nourished their grudge against Man, the violator of their ancient domain, over a thou-

sand leagues of sea, for the *Miami* was a hundred miles to the eastward of the Lookout Shoal, though westward of the limit of the Gulf Stream. The billows thus had a stretch of unbroken ocean from the frozen continent of Antarctica. Of this they made full use, and staunch little vessel though the cutter was, she was making bad weather of it.

The fog was dense and the gale whipped the spray into a blinding sheet. This was varied by squalls of sleet and hail and for three hours a blinding snowstorm added to the general discomfort. Less than thirty miles to the eastward lay the Gulf Stream, where the water was over 70° and where no snow could ever be, but that gave the crew of the *Miami* little comfort.

It was not a coast on which vigilance could be relaxed, and Eric was glad when the search for the *Madeleine Cooney* was abandoned for a while. It was time, too, for the *Miami* had all she could do to take care of herself. The Coast Guard vessel was midway between the Frying Pan and the Lookout Shoals, two of the most famous danger points on the Atlantic coast, and the wind had risen to a living gale. The first lieutenant was on the bridge a great deal of the time. For forty-eight hours there had been absolutely no sign of the sun or

any star. There was no way to determine the vessel's position except by dead reckoning—always a dangerous thing to trust when there is much leeway and many cross-currents. The lead was going steadily, heaved every few minutes, while the *Miami* crept along cautiously under the guidance of that ancient safeguard of the mariner.

It was the evening of the second day after the worst part of the blow started that the *Miami* dropped her anchor in eight fathoms of water off the North Carolina coast. Steam was kept full up, although the position of the cutter in the lee of a point of land precluded the immediate possibility of her dragging her anchors.

Almost exactly at noon the next day, the wireless operator intercepted a message from the Norfolk Navy Yard that the steamer *Northwestern* was anchored 55 miles southwest of Lookout Shoals, with her propeller gone. As this position, pricked on the chart, showed the steamer to be in a dangerous and exposed position, and as, moreover, she was a menace to navigation, being full in the path of vessels, the *Miami* got under way immediately.

As soon as the Coast Guard cutter reached the bar, a snowstorm, which seemed to have been waiting around, as if for that very purpose, struck

down upon the water and the *Miami* clawed out over the bar in a blinding smother. There was a nasty, choppy sea, the wind having hauled round to the westward, though it was not as violent as the day before. At two o'clock in the afternoon the radio operator received a storm warning for a nor'wester.

A passing vessel spoke the *Miami* by wireless and stated that she had sighted the *Northwestern,* but gave her position twelve miles to the westward of the point first quoted. It was evening before the steamer in distress was sighted. The Coast Guard cutter ran up under her stern, and asked if she could hold on for a while. The captain of the steamer answered that he could.

" I'm all right, so far," he shouted back through the megaphone; " it's that blithering bally-hoo of a propeller! "

His language was picturesque, fluent, and convincing, and everybody on board the cutter grinned while the old sea-dog expressed a highly colored opinion of the whole tribe of ship-fitters, machinists, and mechanics generally. After ten minutes of descriptive shouting, during which he never repeated an adjective twice, he wound up by saying that he considered " an engine-room an insult to a

seaman's intelligence,'' and said that '' he'd like to pave the bottom of the sea with the skeletons of engineers diving a thousand fathom for his lost propeller!'' Following which, he seemed to feel better, and discussed what was best to be done with his ship.

The situation was dangerous. The sea was far too rough for the lowering of a boat, no matter how well handled. The gale was such that it was unsafe for the *Miami* to anchor. In the case of the *Northwestern,* anchoring had been her last resort. There was fully twenty fathom of water, and fortunately the steamer's anchors held. The captain had put ninety fathom of chain on each anchor, and though the weight pulled her nose into the water, so that she snubbed into the sea like a ram trying to butt down a wall, still everything held. The *Miami* stood by all night, keeping close to the imperilled vessel.

Next morning the conditions were no better. The advantages of daylight were more than overcome by the increased fury of the sea. The *Northwestern* lay in an angry rip, for the gale had come on in full force and was countering the long rollers from the southeast that had been blown up by the storm of two days before, the same which

Courtesy of U.S. Coast Guard.

MAN'S WATERSPOUT. A DERELICT'S END.

Courtesy of U.S. Coast Guard.

PREPARING TO BLOW UP A DERELICT.

had driven the *Miami* to shelter and which had crippled the big steamer, twice the size of the revenue cutter. The *Miami* stayed near by, hove to, waiting for the storm to abate. But of this there were no signs. The force of the gale increased steadily through the day.

The *Northwestern* was pitching terribly. She was heavily loaded with a cargo of crude oil, and as she swung to the squalls, the sea breached her completely and continuously. Only her high bow, poop, and pilot-house were out of the water for any length of time. The big steamer was tearing viciously at her anchors and it was amazing that they held. The long scope of chain, however, was probably her salvation.

As darkness came on, the captain of the *Miami* called the first lieutenant.

"Mr. Keelson," he said, "I think we'd better get a line to the steamer."

"Very well, sir," the other answered.

"If we're going to take her in tow," said Eric to Homer, overhearing the order, "we're apt to get our stern works pulled out of us. She's pitching like all billy-o!"

"We'll make it if the skipper says so," his friend said cheerfully.

It was then nearly half past four o'clock, and fortunately there was just a slight lull in the storm. Swinging across the *Northwestern's* bow the gunner shot a line into her rigging. The steamer's crew were on the alert—they had good men aboard that craft—and tailed on to the line. The *Miami* forged ahead and dropped anchor with sixty fathom of chain on the disabled steamer's starboard bow.

The *Northwestern* had got enough steam up for the donkey engine. It did not take long for them to get first a strong rope and then the big hawser aboard, and make fast. As soon as the hawser was aboard, the *Northwestern* began to heave up to her anchors. Closely watching, the *Miami* hove up to hers, ready to break at the same instant that the steamer broke free. The instant the larger vessel's anchor raised, the *Miami* swung hers free, to avoid fouling, for in so fierce a gale the merest touch would have been fatal to one or both vessels.

The *Northwestern* swung down broadside to the sea and stood a fair chance of being swamped. The *Miami,* however, going ahead at full speed, just managed to bring the strain on the tow-line in time to swing the steamer clear into the crest

of a huge comber which struck her bow harmlessly instead of hurling its tons of water on her unprotected deck.

The strain on the *Miami* was extremely great, but the hawser held well, although the *Northwestern* yawed frightfully. She would run up on the line, and the sea would strike her bow, throwing her off, tightening the tow-line suddenly with a jolt that shook the *Miami* from stem to stern. It was an awful night's tow, but just at eight bells of the middle watch the cutter and the rescued vessel passed the Frying Pan Shoals Lightship, and as soon as they got within lee of the shoals they met a smoother sea. At nine o'clock the next morning the *Northwestern* was safe and sound in a good anchorage in Southport at the mouth of the Cape Fear River.

When Eric came on deck again, he found the *Miami* on her way south again on the search for the derelict, *Madeleine Cooney,* this time reported by the United States Army mine planter, *Schofield.* Two days afterwards in latitude 27° 52′ N., longitude 84° 34′ W., a vessel was found in 65 fathom of water, with her anchor down, burned to her main deck and on fire aft. She was dismasted and her bowsprit had gone. Eric was sent in charge

of one of the boats to run a line. The sea was comparatively smooth, so that the *Miami* made fast alongside her stern and put two lines of hose aboard. The cutter's heavy pumps were attached and in fifteen minutes the fire was out.

The anchor chain was fouled, so the first lieutenant gave orders that the cable should be slipped. Some of the cutter's men worked around the masts floating alongside and the entangled rigging, and cut away enough of the rigging to make a heavy wire bridle which was passed through the hawse-pipes in the burned vessel's bow. This was necessary as none of the upper works of the ship remained to which a tow-line could be attached. To this bridle was bent the ten-inch hawser of the *Miami,* and the derelict was towed into Tampa Bay.

On the way, however, rough weather came up and the masts and spars broke adrift. As they were right in the path of traffic, the *Miami* went back to destroy these. The spars were separated and allowed to drift, as the set of the current would soon take them ashore out of harm's way. This got rid of everything except the lower part of the mainmast. As this heavy spar itself might be the means of sinking a vessel if left adrift,

tossing on the waves, the *Miami* parbuckled the big timber on board, chopped it into small pieces—none of them large enough to do a vessel any damage—and set them afloat.

The weather continued squally as the *Miami* ran down the coast, the tag end of the gale blowing itself to tatters on the stretch from Cape Hatteras to Cape Fear. Little though Eric realized it then, before the year was out, he was destined to know that coast from painful experience and every curl of those hungry breakers was going to be imprinted on his brain.

The *Miami* was off Cape Canaveral when a radio message was received that there was a derelict bark two hundred miles to the westward of Abaco Island, the northernmost of the Bahamas. In less than three minutes after the receipt of the message over the wireless, the captain had been advised, the course changed and the *Miami* was headed for the derelict at full speed. She had been running for a little over an hour when a second radio was received from a land station, relayed from a steamer.

"Schooner *Marie-Rose* reports passing waterlogged vessel 23° 40′ N. and 73° 10′ W. Signs of distress observed. *Marie-Rose,* crippled and run-

ning before gale, could not heave to. Not known whether any one on board."

Then the wireless began to be busy. Within twenty minutes the same message was received from Washington, from the station at Beaufort, N. C., from Fernandina, Fla., from Key West and from Nassau. Then by relays from vessels on the coast, from the *Seneca,* the Coast Guard's great derelict destroyer, far out on the Atlantic; from the *Algonquin,* stationed at Porto Rico; from the *Onondaga* patrolling the coast north of Cape Hatteras and from the *Seminole* in port at Arundel Cove undergoing repairs, came orders from the Coast Guard Headquarters. The *Miami* was instructed to proceed at once to the point indicated, to rescue survivors if such were to be found and to destroy the derelict which was floating into the trade route and was a menace to navigation. Meanwhile, the long harsh " buzz " of the answer sounded all over the ship from the wireless room as the operator answered the various calls with the information that the *Miami* was already proceeding under full speed.

" Van Sluyd will be sore," said Eric to Homer, as the message from the *Seminole* was received; " she'd be sent instead of us if she weren't in

dock. When he hears that we're going on this chase instead of his own craft, he'll be green with envy."

"He'll get over that," said his friend; "he's under a good man. There's very little gets by the *Seminole* that is possible of achievement."

Dawn was breaking as the *Miami* neared the spot indicated by the wireless messages as the location of the derelict bark. Using this point as a center, the navigating officer of the *Miami* plotted a chart of the U-shaped course which would enable her to cruise and cover the greatest amount of space without doubling. At about four bells in the afternoon watch the speaking tube on the bridge whistled.

"Something that looks like a derelict, sir," came the message from the man in the crow's-nest, "bearing about a point and a half for'ard of the port beam."

The officer of the deck gave a sharp order to change the course and the *Miami* swung round. The captain was on the bridge at the time.

"Observed anything, Mr. Hamilton?" he queried.

"Lookout reports an object, now right ahead, sir," was the reply. He picked up the tube again.

"Can you see the derelict now?"

"Yes, sir," came the reply; "we're a-raisin' her fast."

"She must be nearly flush with the water," said the officer of the deck, handing the glass to the captain; "I don't see her yet."

In half an hour, however, there was no doubt that this was the derelict that had been reported by the *Marie-Rose*. As the *Miama* neared her it was evident that she was heavily water-logged. Her bow was deep under water, only her stern appearing above the surface. On the poop rail had been hung a shirt, the white gleam of which might have been the distress signal referred to in the message of the *Marie-Rose*. The *Miami* slowed up as she neared the derelict to survey the wreck. Suddenly there came an order,

"Clear away both cutters! Lively now, lads!"

The men sprang to stations at the word.

"Lower away together! Easy now! Let go all!"

And with the routine of clockwork two of the *Miami's* boats were in the water and off for the derelict. The sea was choppy but not high, and the water-logged bark lay so heavily that she scarcely moved. The waves came up and dashed

over her almost like a rock. One of the second lieutenants, who was in charge of the large boat, was first to round the derelict. From the lee side, he pointed with his finger.

"There must be somebody aboard her," said Eric, rightly guessing the meaning of the gesture. Then, noting the manner in which the other boat kept away, he realized that the wreckage was on that side. Wrenching the tiller round, he called,

"Back starboard!"

The boat spun round like a top, sweeping right under the vessel's stern.

"Give way to starboard! Easy port!"

The boat slid up alongside the derelict as though coming to a landing place. The men trailed their oars, the bow oar grappled with a boat-hook and Eric leaped for the poop rail of the vessel, and swung himself aboard. The deck was pitched forward at an angle of 30 degrees, but evidently the vessel had floated in that condition for some time, for a sort of barricade had been made, with the right angle of the half-sunk cabin companion hatchway as a base, and on this three bodies were lying. A keg of water and a maggoty ham—the latter exposed to the full sunlight of the tropics—was all the food in sight.

Eric slid down the deck to this barricade. The first man seemed to be dead, the heart of the second was beating feebly, but the third, a white-haired old man, appeared only to be asleep, the deep sleep of exhaustion. When the boy put his hand on his shoulder, the old man opened his eyes wide.

"So you have come the third time," he said, in a queer far-away voice, "but it is too late."

Eric slipped his hand into his coat pocket and brought out a small phial of restorative he had provided just before leaving the cutter. He gave the survivor a few sips. The old man changed not a muscle, only repeated in the same dull and far-away voice,

"So you have come the third time, but it is too late!"

Perceiving that the sufferer regarded him as an apparition and that in his hallucinations born of exhaustion and exposure he must have believed he saw rescuers before, Eric picked the old man up bodily and, half crouching, half climbing on the sloping deck, carried him to the derelict's side. Two of the sailors climbed up and helped him lower the old man to the boat.

Meantime the other boat had made fast and the

Courtesy of U.S. Coast Guard.

THE GREATEST MENACE OF THE SEAS.

A sunken derelict ready to sink any vessel that strikes her.

Courtesy of U.S. Coast Guard.

BURNED TO THE WATER'S EDGE.

Vessel abandoned and floating in the path of commerce, hunted as a dangerous beast, and found by the Coast Guard cutters.

second lieutenant joined him. He was a man of considerable experience, and while Eric was quite proud of his knowledge and skill as a life-saver, he was amazed at the deft handling of his superior officer.

"I think this one's gone," said Eric in a low voice, pointing to the first man he had seen.

The other cast a quick look at him and shook his head.

"Pretty far gone, but not quite," he answered. "There's always a fighting chance that we can pull him through. I'll take these two into my boat and get back to the cutter. We'll probably blow this craft up, afterwards; we couldn't ever tow her this way."

"Why, sir? Because she's too heavy?"

"Not only that, but she lies too low. On end, the way she is now, she's probably drawing thirty-five or forty feet of water. She might stick in a channel somewhere and that would be worse than getting rid of her out here."

The boats raced back to the ship and the survivors were handed up to the *Miami* where the surgeon immediately took charge. All preparations had been made, meanwhile, for the placing of mines and Eric was told off in the boat un-

der the second lieutenant to see to the placing of the charges.

This was work to which Eric was unaccustomed and he watched with considerable interest the gunner's handling of the mines. It was easy enough to place the charges in the upper works of the stern where they would be sure to blow that part of the ship to pieces, but so much of the forward portion of the hulk was under water that the problem there was more difficult. In order to make sure of the job, five mines were set and connected with each other by electric wiring. A long strand of insulated wire was then carried to the boat, over a hundred feet in length.

At a signal given him by the lieutenant, Eric pressed the button. There was a tremendous roar as a waterspout shot up from the surface of the sea. As though some vast leviathan had passed underneath the old bark and shouldered her out of the water, the long black hull heaved herself up slowly. She seemed to hang poised for a fraction of a second on the surface of the water as if, in her death agony, she had for a moment thought of her old life when, under press of sail, she flew bounding over the billows, defying the very elements which at last had worked her ruin.

Only for a moment she hung there, then with a dull crash she broke her back. The bow plunged downward with a sullen plunge, but the stern still held poised. Then, quite suddenly, the air imprisoned in the hull broke free and slowly, almost, it seemed, with dignity, the remainder of the vessel sank forever beneath the surface of the waters.

It was the end of the *Luckenback* and somewhere at the bottom of the sea her distorted steel plating marks the spot where rest the nine members of her crew lost before the rescuing Coast Guard cutter hove in sight.

CHAPTER XI

THE WRECKERS OF THE SPANISH MAIN

"Well, Eric," said Homer Tierre to his friend, as they stood together one evening a few days after the rescue of the survivors of the *Luckenback,* watching the phosphorescence of the sea, "we're getting down to the old Spanish Main, now."

"Isn't that a great word for bringing up ideas!" exclaimed Eric in reply. "It makes one think of the old stories we used to read as kids, of the black flag with the skull and crossbones and all that sort of thing. Too bad there aren't any pirates left!"

"I suppose you'd want us to go chasing them!"

"Of course. We should have to, if there were any, wouldn't we?"

"Certainly," his friend answered. "Don't you remember how the old bos'n of the *Itasca* used to tell us about the early days of the Revenue Cutter Service when chasing pirates was a regular

part of its duties? Officially it is still, I suppose, but there aren't any more pirates to chase."

"What has put them all out of business?" Eric said thoughtfully. "I've often wondered."

"Steam, mainly," his friend replied, "that 'insult to a seaman's intelligence,' as our friend the fluent skipper of the *Northwestern* called it."

"But I don't see why," persisted Eric. "After all, in the days of sailing ships, the pirates only had sailing ships—and they weren't always such an awful lot faster. Why couldn't pirates to-day have steamships, just as fast in comparison to the steamers of to-day as their clippers were to the sailing ships of old? They'd get much bigger hauls. Why, one good hold-up of an Atlantic steamer would make a pirate crew rich for life!"

"You'd better take to the trade," suggested his companion.

"I'd sooner do the chasing," replied the boy; "it's much more fun, anyway, and I'd rather be on the right side, every time. But don't you think that there really would be a chance for a big Atlantic greyhound pirate?"

"I don't think so," the other answered meditatively. "For one thing, we'd have pirates if there was any such chance. After all, Eric, you've

got to remember that a pirate was successful because of his own personality. They were a mighty forceful lot—Kidd, Blackbeard, Lolonnois, and all those early pirates. On a big steamer, the pirate captain wouldn't have the same sort of chance. There's too many in a crew, for one thing. Then he'd be practically at the mercy of his engineers and engine hands. In a mutiny, he'd be up against it for fair."

"But if a pirate captain could bluff a couple of mates and forty sailors in his crew, I don't see why he shouldn't be able to bluff a couple of engineers and fifty stokers," suggested Eric.

"Even supposing he did," said the other, "suppose he had every man on board terrorized, or so heavily bribed that they would obey him to the letter, still his troubles would have hardly begun. In the old days, as long as there was food and water aboard, a sailing ship could cruise around for months at a time. A steamer needs coal."

"She could take the coal from the bunkers of the ships she held up," suggested the boy.

"It would be a good deal more of a job than you reckon," the other answered. "She couldn't do it at all if there was any sea running, and even on a calm day, it's a tricky proposition. If you've

ever seen a man-o'-war on a sea cruise trying to coal from a naval collier, that's built just for that very purpose, you'd get an idea how hard it is. Meantime, what would the crew and passengers of the liner be doing?"

"Putting in coal, or getting shot down if they resisted."

"You've a bloodthirsty turn of mind," his friend rejoined. "I know the idea, 'scuppers pouring blood,' and that sort of business, eh?"

"Sure," answered Eric.

"You're forgetting a lot of things," the other said. "An old time sailing-ship just had the one deck. When a boarding pirate crew had won the deck, they were masters of the ship. But a modern steamer is like a building with several floors, one on top of the other. A pirate crew which could put aboard a steamer as many men as the steamer itself carried, and still handle itself, would be a small army. What's more, on a modern steamship, with half a dozen stairways and the whole inside a labyrinth of rooms, the pirates would be ambushed like rats in a trap a dozen times over."

"Yes, there's something in that," the boy agreed.

"Then there's the wireless," continued Homer. "Supposing a pirate steamer hailed a craft. Long before the first boatload of men could board, or before the ships could have grappled, the wireless operator would send an 'S O S' call, with a description of the piratic vessel and the latitude and longitude. The pirate couldn't get coal aboard in less than twelve hours, and by that time half a dozen vessels would be steaming at full speed to the spot."

"What difference would that make?" said Eric. "If the pirate were armed with heavy guns, she could stand off a fleet of commercial vessels that didn't have any armament."

"Your imagination is working in great shape, Eric," his engineer friend replied. "It's a pity you don't think far enough ahead."

"How's that?"

"I suppose you'd have your pirate vessel chosen for speed?"

"Of course," the boy answered. "She'd have to be fast in order to make a getaway."

"Here's where you're forgetting your shipbuilding," his friend warned him. "Could she have speed if she were armed with heavy guns?

Wouldn't she necessarily have to be partly the build of a man-o'-war, say a cruiser? ''

'' Perhaps she would,'' said the boy thoughtfully.

'' And if she had the build of a cruiser, would she have the speed of an Atlantic greyhound? ''

'' That's true,'' admitted Eric, '' she wouldn't. Still that wouldn't matter, if the only craft that could chase her was a craft without guns.''

'' Wouldn't it? '' his friend queried. '' Do you know how they chase wolves in some parts of Western Canada? ''

'' No.''

'' They use a couple of greyhounds and two or three heavy dogs, like bulldogs or Airedales or wolfhounds. The wolf can easily outrun the heavy dogs, but when it comes to real speed he isn't in it with a greyhound. The greyhounds overtake Mr. Wolf in less than no time, nip at him, worry him, anger him until he turns on them. They won't even try to fight and he hasn't a chance of catching them. Meantime, the heavy dogs, following up the scent, come pounding along the trail. The wolf sees them and lopes off again, the greyhounds after him. They badger and

worry him again, and again he turns. By the time this has happened three or four times, the heavy dogs have caught up to their quarry, and the fight is on. Two or three minutes and it's all over, and there's one wolf the less to harry the flocks of sheep."

"Well?"

"That's just about what would happen to this pirate of yours. Suppose he did stop an Atlantic steamer, suppose he did board her successfully, suppose he got his coal bunkers full, suppose he carried a heap of treasure to his own vessel flying the Jolly Roger and got away with it. He'd have the other ships around, wouldn't he?"

"I suppose he would," Eric admitted.

"You can bet your last dollar he would. And their wireless would be working overtime, wouldn't it?"

"Of course."

"Piracy is a matter that every maritime nation is interested in. The newspapers of the world would have the story by wireless the next morning, the governments of the world would know almost as quickly. By noon the next day half a dozen warships would be steaming from different directions in search of the pirate, led

Courtesy of U.S. Coast Guard.

FOAM—THE DERELICT'S ONLY TOMBSTONE.

Courtesy of U.S. Coast Guard.

MINING A LURKING PERIL.

A submerged derelict, waterlogged, scarcely visible, for which a diver must be sent down to place the mines.

as straight as a magnet to the pole by the radio information constantly being sent from the light passenger steamers that were pursuing. If the naval fleet included a destroyer with a thirty-knot speed, where would your pirate get off at? ''

'' He wouldn't have a show. I see,'' continued Eric, regretfully, '' I'll have to give up the hope of being able to join in a real pirate chase.''

'' Of course,'' the young engineer said thoughtfully, '' a pirate in a submarine might be able to do something.''

'' Now there's a real idea,'' exclaimed Eric. '' Maybe there's a chance yet! ''

'' I'm afraid not, even there,'' answered the other, smiling at his friend's eagerness, '' mainly because of that same question of fuel. The captain of the submarine would have to be in cahoots with some supply station, and with the howl that would be made all over the world by modern piracy, it would be hard for the fuel contractor to hide his output. The only way that I can see would be for such a pirate to watch out for ships loaded with what was most needed, run up and threaten to torpedo the craft with everybody on board unless they took to the boats, put a prize crew aboard and run that steamer to a lonely

beach on an uninhabited island and start a supply depot of his own there."

"But a submarine couldn't carry a large enough crew to conquer a steamer."

"They wouldn't need to," said Homer. "It would be enough to send one man aboard to demand the treasure."

"Well?"

"The submarine could lie to, with her submerged torpedo tubes pointing full at the vessel. If within a given space of time the treasure was not shipped and the pirate lieutenant returned safe, a torpedo would be fired which would send the steamer to Davy Jones with all hands. As a captain is more responsible for the lives of his passengers than for their gold, he would have to consent. One might easily get half a million dollars from one of the larger vessels. Three or four cruises of that kind would be quite enough, and our friend, the imaginary pirate captain and all his crew, could retire from the profession."

"But do you really think such a thing is possible?"

"It's very unlikely," his friend replied, "but there's no doubt that it's possible. Several submarines have been sunk in the Great War, and one

or more of these might be fished up by wreckers. Being hermetically sealed, no water would have got in, and their machinery would be as good as ever, even if they had been lying under the water for some months. As for crew—if the pay were big enough, there would be always enough desperate fellows to be found to make the venture. Yes, that plan is feasible enough. And, what's more, it would be hard to stop. Really, the more you think of it, the more possible it seems. The only weakness is the coaling."

"It seems to me," Eric said, "that if she could coal at sea, sink the ship and tow the boats containing the crew within reach of land, she would be pretty safe."

"Yes," his friend answered, "if she could stay at sea indefinitely until treasure enough had been accumulated, I believe a submarine could get away with it. There might be difficulty afterwards in getting rid of the bullion and the jewels, but, after all, that's a different question. It has nothing to do with the piracy."

Eric peered into the darkness, putting his hand over his eyes as though to look intently.

"Pirate, ahoy!" he called softly. "Three points off the starboard bow!"

The young lieutenant of engineers laughed.

"You'll be dreaming of pirates in your next watch below," he said, as he turned away, "or you'll be running up the skull and cross-bones instead of the Stars and Stripes and we'll have to court-martial you."

"Little chance of that," replied the boy, "but maybe there'll be a submarine pirate some day that we'll have a chance to chase. I'll live in hopes!"

By a somewhat curious coincidence, a few days after this conversation, the *Miami* passed the Dry Tortugas, the old-time capital of that Buccaneer Empire which for forty years held the navies of the entire world at bay. It was a curious chapter in the history of the seas, and Eric caught himself wondering whether the future of navigation held any such surprising and adventurous period in store. He was to learn shortly, however, that the Coast Guard was thoroughly fitted to meet similar emergencies and that her naval powers could be made swiftly operative even in times of peace.

As the cutter was proceeding to her station at Key West, she sighted a schooner, which, by signal flags, reported that she had that morning passed a bark flying the reversed ensign, with her

yards awry and her sails aback. On running close to the schooner the *Miami* learned that the bark had changed her course when the schooner approached, and when the schooner fell on her course the bark came aback again. A second time the schooner went to her relief, and again the bark squared off on her course.

"Queer thing," said Eric, after the flags had been read. "What do you suppose it is?"

"Looks like mutiny," said his chum. "I suppose we'll chase her and find out. Too bad the schooner never got near enough to see her name."

"What's the odds? We've got a description. Hello! Forced draft, eh?"

"Yes, it looks like trouble. You wanted to see a pirate chase, Eric. I don't believe that's on the boards, but at least a mutiny chase smacks of the old days."

The information given by the schooner proved to be startlingly correct, for a couple of hours later the lookout in the crow's-nest reported,

"Sail on the port bow!"

"Where away?" asked the chief officer.

"Nearly dead ahead, sir," was the reply.

The captain leveled his glass at the craft. Eric watched him closely, for his expression was puz-

zling. In an hour's time the *Miami* which, under forced draft, was flying through the water, overhauled the vessel. Just as the schooner had reported, the bark was in irons, with her yards braced athwartwise and her sails aback. The British merchant flag was flying at her mizzen-gaff, with the ensign down.

No sooner was the *Miami* within a mile or two of the bark than the vessel squared around her yards and began to scud before the wind. She had a good pair of heels and it was not surprising that the schooner had not started to pursue. There was no real reason why she should interfere. But with the Coast Guard cutter it was another matter. A signal of distress had been seen, an American vessel had called on the cutter, and now the suspected craft was running away. The chase began.

No sooner did the bark realize that she was actually being chased than men were sent aloft, and the fore-royal and main sky-sail were set, a heavy press of the sail for the full breeze. This absolutely determined the fact that the Coast Guard cutter would chase, for the bark was fleeing. It was getting late in the afternoon, and within a couple of hours darkness would close

down. The moon would not rise until nearly midnight, so that there would be two or three hours in which the sailing vessel could give the cutter the slip. Little by little, however, the *Miami* began to close up. The breeze freshened, increasing the chances of the fugitive, but still the cutter lessened the distance between them.

Immediately after dinner, a few minutes before eight bells struck in the second dog watch, the first lieutenant, at the captain's direction, gave orders to clear away the bow gun. The gun crew sprang to stations, and a moment later the sharp crack of a rapid fire six-pounder sounded across the waters of the Gulf of Mexico, an order from Uncle Sam for the fleeing bark to stop.

But the stranger paid no heed. With the glass, figures could be seen on the main deck and on the poop, but it was too far away to determine what they were doing.

The captain turned suddenly to the officer of the deck. "Did you see anything, Mr. Keelson?" he asked.

The officer, who had his eyes glued to his glass, replied,

"I thought I saw the smoke of shots!"

"That's what I thought," the captain an-

swered. Then, in a quick voice of command, he added,

"You may use solid shot!"

A few seconds sufficed to carry out the work.

"Try for her upper spars!" was the next order.

The sharp crack of a shot from the six-pounder was the reply, and simultaneously, holes appeared in the gaff topsail and the main top-gallant staysail. The wind immediately slivered the sails to ribbons and they began lashing about the rigging. At this, the main yards were swung round, the mainsails came aback and ten minutes later the *Miami* was alongside.

Two boats' crews, fully armed, were sent abroad. The situation which greeted Eric, in the second lieutenant's boat, was unusual. A rope ladder had been thrown over the ship's side from the main deck. Above the ladder was an excited group, all shouting at the top of their voices. The senior second lieutenant, who was in charge of the boat to which Eric had been assigned, took command of the party. He asked for the captain. One of the men pointed to the helmsman.

"Are you the captain?" the Coast Guard officer demanded.

"Si, signor," the man answered, "I the captain."

"Johnson," said the lieutenant, "relieve the wheel!"

One of the Coast Guard men saluted, stepped forward and took the wheel. The vessel was hove to.

"Are you English?" the lieutenant asked, when this manœuver had been completed.

"Italiano!" the captain of the bark replied.

"Then what's that flag doing there?" the Coast Guard officer asked, pointing to the reversed British merchant flag which still hung at the gaff.

The other shrugged his shoulders.

"The only one I have. The mate he take the others," he answered.

"Where's the mate?"

An evil-looking fellow with rings in his ears and a long knife stuck in his belt slouched forward. He did not come alone. Half a dozen sailors, evidently part of a gang, came aft with him.

Thinking that a little example might be salutary, the lieutenant turned to the file of men who had come on board with him. The men had their rifles at the carry.

"'Tion! Order arms!"

The butts of the rifles came down on the ship's deck with the precision of clockwork and the rattle was ominous. The Coast Guard officer had a steely note in his voice, as he continued.

"You're the mate?"

"Yes," the man said sulkily, but in good English, "I'm the first mate, all right."

"Did you remove the signal flags from the locker?"

"What if I did?"

"Did you receive orders from your captain to do so?"

"Not exactly—"

"Yes or no!"

"N-no!"

"And was he on deck at the time?"

"Yes."

"Did he order you not to haul down the flag?"

"I don't have to do everything he tells me."

"Did he order you not to haul down the flag? Yes or no?"

"Well, yes."

"And did you haul it down several times?"

"Yes, but—"

"I don't want to hear your excuses or your rea-

Courtesy of U.S. Coast Guard.

STRANDED! AFTER STORM HAS CEASED AND TIDE HAS EBBED.

The end of a gallant bark driven on a lee shore, but from which the Coast Guard rescued every one on board.

sons. That's mutiny," the lieutenant said, simply. Then, turning to the captain, he said,

"Do you accuse him of mutiny?"

"Yes," the master answered, "he mutiny."

"Put the irons on him, Quartermaster," said the lieutenant, and handcuffs were snapped on the first mate's wrist.

"Any more of your men mutiny, Captain?" asked the lieutenant.

"I tell you whole story," the shipmaster answered. "You speak Italian?"

"French," the Coast Guard officer answered, "but not Italian."

"French? Fine!" the captain replied, and stepping forward, he told the story of the trip. It appeared that the ship had part of her cargo consigned to Vera Cruz, consisting of cartridges, designed for the Mexican government. The mate had practically seized the ship and demanded that the captain sail her to Puerto Mexico, one of the southern ports, in the hands of the Zapatistas. The Mexican rebel general was to pay a good price for the ammunition, and then the captain was to be allowed to proceed with the ship unmolested on the rest of his cruise.

As the ammunition had been shipped from an American port, the Coast Guard lieutenant realized that complications might ensue. Accordingly, since it was only a few hours' run to Apalachicola, and the wind was fair, the lieutenant advised the Italian captain to run for that port and deal with the question of the mate and the other three mutineers before the proper court.

A file of men, under command of Gunner Sternow, was left on board the bark to preserve order. The mate and the three other mutineers were thrust in irons into the carpenter's shop, which was converted into a prison for the purpose, one of the cutter's men standing on guard. The following morning, the harbor authorities of Apalachicola having been notified by wireless, a tug came off bearing authority for the formal arrest of the four men, who were taken ashore and put in prison, pending action by the Italian consul and the civil authorities.

"I suppose this mutiny business is rather rare," said Eric to Homer, as the *Miami* swung out of Apalachicola Bay.

"Not so rare as you'd fancy," his friend answered. "There's not a season goes by that some of the cutters don't have to take a hand in

settling mutiny. Why, only last year, a crew seized a vessel, in the real old-fashioned pigtail and tarred-trousers style, imprisoned the master in the cabin, and started to sail the ship back to the United States on their own hook."

"Where were they bound for?"

"'Frisco, from Philadelphia, round the Horn. She was the *Manga Reva,* an American full-rigged ship with a crew of twenty-three men. She was about 600 miles out when the men mutinied and sailed her back to Delaware Breakwater. The master succeeded in running up a distress signal, which was reported to the *Onondaga.* You know her station is just north of Hatteras. The *Onondaga* put an armed crew on board, and took the mutineers on board the cutter, steamed up the river to Wilmington, Delaware, where they were turned over to the Federal authorities to await trial."

"What did they get?"

"Pretty heavy terms of imprisonment," the other answered; "mutiny on the high seas is a mighty ticklish thing."

"What do you suppose this mate we collared will get?"

"Hard to say," the other answered. "After

all, he's an Italian, sailing under Italian colors. Uncle Sam's always careful about international law. But the Italian maritime laws are very strict, and if he's sent back to Italy, I'm sorry for him."

For the next two months, little of adventurous importance occurred. The *Miami* disposed of several more dangerous derelicts in the gulf of Mexico. She assisted a small steamer belonging to the Public Health Service of Key West, which had anchored in an exposed position, and towed her to safe moorings. She rescued two men in a small motor boat, out of sight of land, who had drifted after the machinery had broken down. In addition to this, she floated and towed to harbor three sailing-vessels which had struck on the treacherous reefs of the waters of the Florida Keys. The work was constant, and the Coast Guard cutter was on the job without ceasing, but there was little to stir the complement to their utmost.

Then came trouble. From the wireless station, —that continuous recorder of difficulty and disaster, came word that a Norwegian steamer was ashore on Twisted Cay, and asking for immediate assistance against native wreckers. The *Miami* immediately started for the scene of the disaster,

and about noon of the next day arrived in sight of the vessel.

"They've been having trouble of some sort," said Eric, as the cutter steamed up to the scene of the wreck. "And look at the nerve of them; they don't seem to pay any attention to us!"

The boats' crews were ordered out, and Eric, as before, was in the smaller craft. The two boats pulled to the side of the vessel, and the boy accompanied the second lieutenant on board. The steamer was lying with her head to the southward and westward, with a decided list to starboard. Twenty or thirty small sailing-boats were clustered round her, like ants round a piece of sugar. What was still more daring, while most of the wreckers had left the stranded steamer on the arrival of the cutter, others actually stayed on board. They were an evil-looking lot, and heavily armed.

The scene on board was a striking one. The first thing noticed by Eric was the presence of two men propped up against the starboard rail, pale and roughly bandaged.

"Where's the captain?" was the lieutenant's first question.

"I'm Captain Jorgsen," was the reply, as a

finely built, ruddy middle-aged man advanced. "Glad to see you on board."

"Good morning, Captain. You reported by wireless having trouble with these wreckers," the Coast Guard officer remarked; "are these men of yours badly hurt?"

"One of them is," the captain answered. "Have you a doctor in your party?"

"We've one aboard. Mr. Swift," he continued, turning to Eric, "will you please take the boat and bring Dr. Fuhrman here?"

Eric saluted and was in his boat almost on the instant. The doctor, guessing that possibly the call might be for him, was waiting at the ladder with his instrument-bag in case he should be needed. Formalities were unnecessary, so that when the boat pulled alongside and Eric, looking up, saw the doctor at the rail he called,

"Couple of patients for you, Doctor."

"Right you are," was the answer, and the surgeon came down the ladder as nimbly as Eric could have done himself. On arriving at the wrecked steamer, it was found that the injuries were knife-wounds, one of them deep and necessitating an immediate operation.

As there was a good deal of likelihood that the

steamer might go to pieces on the reef if a storm blew up, it was decided to take the two injured men to the *Miami,* where the doctor could give them better attention. Owing to the difficulty of the steamer's position on the reef, with the surf breaking over her to the windward and the rocks to lee, this trans-shipment of the injured men was not accomplished without difficulty, but by three o'clock in the afternoon, the men were safely on board the cutter.

Meantime the lieutenant had been trying to place the responsibility for the crime, but this was impossible. All that the captain of the steamer could say was that, during a fight with the wreckers the preceding night, these two men had been knifed. In response to questions, Captain Jorgsen expressed the hope that some of the wreckers had got hurt themselves, but he regretted that his crew had been defenseless, with nothing but belaying pins and such like weapons for their protection. As the belaying pins in question were iron and twice as heavy as a policeman's club, Eric could not help smiling at the suggestion of inoffensiveness that the captain conveyed.

At the request of the captain of the steamer, the *Miami* agreed to lie by her through the night,

until the arrival of a wrecking tug from Havana, a message having been received by the *Miami* that the tug had started for the scene of the disaster. Steam had been kept up on the wrecked steamer for the handling of the winches and so forth.

Suddenly, in the middle of the night, about two bells in the middle watch, a succession of short, sharp whistles from the steamer pierced the darkness. The first lieutenant of the *Miami* was on the deck in a few moments. Meantime, the officer of the watch had ordered the searchlight thrown on the steamer.

The light revealed the deck a struggling mass of men. In the darkness all the wreckers had gathered to board their victim, and at a given signal not less than a hundred and fifty men had swarmed on to the vessel's decks.

The crew was pinned back into two groups, fighting like wild-cats. Most of them, powerfully built Scandinavians, were sweeping aside the natives before them, but the odds were overpowering. The negroes shouted and yelled as they tried to beat the sailors down. Already the main hatch had been forced open and a stream of men was pouring down, for the wreckers knew of valuables which formed a part of the cargo.

A few sharp orders, and the cutter's boats were off to the wreck, the crews armed, their rifles loaded with ball. At the same time, one of the six-pounders was let loose and sent a few shots whistling over the steamer, illumined only by the patch of intense white light thrown by the search-light of the *Miami.*

The boats were half-way across to the steamer, where there was a sudden cessation of the fighting, and over the side of the vessel the wreckers came swarming like rats leaving a sinking ship. But the *Miami's* men had been too quick for all to escape and more than a dozen of the natives were pinned on board.

As soon as the wreckers had heard the *Miami's* guns and fled, the tide of battle turned, and on the dozen which remained, the crew of the steamer had taken a swift vengeance. None of them was seriously hurt, but they had been beaten up in a way that they would remember to the end of their days. Captain Jorgsen, who had been in the thick of the fight, was to the front when the cutter boats landed.

"I wish you'd put a hole in every one of those thieving boats," he growled.

"They deserve it, all right," the Coast Guard

officer answered, " but I doubt if the Department would approve."

" If I had a gun like yours," said Captain Jorgsen, grimly, " I'd fire at 'em an' keep firing until I didn't have a shot left in the locker."

" I'm afraid we can't very well send you over one of our six-pounders," said the other, " but it seems to me you have a right to protect yourself from being boarded in this way. I'll send over some small-arms and ammunition in the morning and we'll stand by you and keep these black rascals in order. But I wanted to ask you, Captain Jorgsen, how did you come to be so far out of your course? "

" I was right on my course," the skipper growled. " That's what makes me so sore. But when I passed Cross Keys light, I thought I must have figured wrong. I never stopped to think why the light was nearly a quarter of a degree from where she should have been by my reckoning, and I changed my course by that."

" Well? "

" One of my men heard those chicken-livered black-hided cowards laughing to themselves about the way they fooled vessels with their ' patent light.' "

Courtesy of U.S. Coast Guard.

THE SIGNAL OF DISTRESS THAT WAS NEVER SEEN.

The missing lifeboat from the burned steamer, *Columbian*, abandoned. Note the coat at the masthead.

"You mean that the wreckers have put up a false light to lead vessels on to the reefs?"

"It's that decoy light that brought me here," said the skipper, "and if you hadn't come when you did, I reckon every one of us would have had our throats cut and the vessel would have been skinned by this time."

CHAPTER XII

THE GRAVEYARD OF THE DEEP

Following on the information given by the captain of the Norwegian steamer, which had so nearly been looted by wreckers, the *Miami* started on a search for the decoy light that had led that steamer to her fate. The captain was an able navigator, and, until the moment he had seen the false light and been led astray by it, he had been absolutely upon his right course. Under such circumstances it was not difficult to find the latitude and longitude where the captain reported having first seen the light. He had also given the bearing in the log, so the *Miami* crept slowly forward in the direction indicated, heaving the lead constantly for treacherous shoals.

From where the captain of the steamer had cited his position there was not a single sign of a lighthouse or a light. But, as the *Miami* crept on, far out of the regular ship's channel, as suddenly as though it had been just placed there,

rose a spar, held in place with three wire stays. On the top was a little round platform, not more than a foot across, and spikes had been driven into the mast to act as a ladder by which to climb it. The *Miami* was almost on the tiny outcrop of rock before the mast was visible. It was painted a watery blue, which merged in with the color of both sea and sky, and was exceedingly difficult to see.

A boat's crew was sent ashore to demolish the mast and also to make a search for the light. To Eric, who went ashore with the men, it was quite an exciting hunt, "almost like looking for Captain Kidd's treasure," as he said afterwards to his chum, the young lieutenant of engineers. The quest was in vain, for though every inch of the islet was searched, there was no sign that the ground had been disturbed. So far as that went, there was very little ground to disturb, for the islet was little more than a coral rock, nearly covered at high tide. It was evident that the wreckers, when they were ready for their work, brought the light with them.

As the light for which the decoy was intended to be a substitute was quite a powerful light, with a regular occulting flash, the decoy itself must be

powerful, and the *Miami* was anxious to trace it. If the native wreckers had such a lantern in their possession, probably they had some kind of clockwork and could alter the occultation of their decoy so that it would duplicate any one of several different lights on the coast.

It was not until some time afterwards that the Lighthouse Service learned that there actually had been such a light in the hands of the wreckers at one time. In a quarrel among themselves, however, over the division of the spoils of a small schooner which had run ashore, one of the disgruntled wreckers had thrown the lantern overboard in deep water.

"I hadn't supposed there was anything of that sort going on now, sir," said Eric to one of the junior lieutenants, discussing the question of the wreckers' lights.

"Nor had I," was the rejoinder. "The business of being a wrecker has changed a good deal. There's plenty of it, still, but it has become a recognized profession. A wrecker, now, has offices in a big seaport, with a fleet of ocean-going tugs and a big bank-roll. When a ship is reported ashore, either her owners pay him to float her, or he buys the wreck outright and takes his

chances of being able to recover the purchase price. If luck is with him, he may get a good ship and cargo cheap, but if fortune frowns and a storm breaks her up before he can save the cargo, then he suffers a heavy loss. It's a good business, but a big gamble."

"I should think there was a lot of excitement in that business, yet!"

"Yes, there is. But it is organized now and wonderfully handled commercially. It's only in places like these outlying fringes of the Bahamas, that the native wrecker—the one who lives by robbery and loot—can still be found. In the old days, a decoy light was a regular thing. There were organizations that had offices in the cities, who used to make a business of this wrecking. Barnegat, New Jersey, was a famous point in the first part of last century. All the inhabitants were in league with the wreckers, there. Many and many a good vessel, in the early days of American shipping, was lured directly on to the treacherous beach, while the wreckers looted everything they could get, and plundered the passengers and crew. That's all done away with now. The United States coast is too thoroughly patrolled by the Coast Guard for any such business as that to flourish.

"I think the Wolf Rock story is perhaps the best example of the idea of deliberately wrecking vessels. You've heard of Wolf Rock?"

"Yes, sir," said the boy, "it's in the English Channel, off the coast of Devonshire."

"Did you ever hear why that particular rock was called Wolf Rock?"

"No, sir," answered Eric, "I don't think I ever did. Is it because of the shape of it, or because the sea breaking over it is like the fangs of a wolf or something like that? There generally isn't an awful lot of reason for the names of rocks and reefs."

"There is for this one," said his friend. "It isn't because it looks like a wolf, but because it howls like a wolf."

"You mean the fog-horn does?"

"No, I mean the rock does, or did," was the reply.

"How?"

"You've heard of blow-holes?"

"Yes, sir," said Eric, "there's one at the Farallones Islands. You mean those holes that make a noise when the tide comes in and out?"

"That's the idea. The Wolf Rock was a most famous case of that. It had a large cavern inside

and a very small hole through the rock at the ceiling of the cavern. Then there was a cleft or fissure through the rock right down to this little hole. You can see for yourself that when the tide started to come in, it closed the sea entrance to the cavern, imprisoning a lot of air. Then, as the tide rose steadily, the pressure of the water drove the air out of the cavern through this little hole, continually making an intermittent blowing sound. The great cleft in the rock acted like the horn of an immense megaphone. This gave rise to a roar, high-pitched—owing to the smallness of the hole —like a wolf's howl. Night and day, but more especially when the tide was coming in, the howl of the Wolf Rock sounded over the sea to warn mariners of the perilous crag."

"Handy," remarked Eric; "it would save the Lighthouse Service a good bit of money if every rock could be fixed like that."

"It didn't do the English Lighthouse Service much good," said his friend. "What do you suppose the good people of Devonshire did? They set to work and hunted for weeks to try to find the hole, but it was so small that they failed. At last, having made up their minds that the Wolf Rock should cease to give its warning, they com-

bined together and carted boulders from the beach to the top of the rock, with incredible labor, and after a month's hard work filled up the entire lower part of the chasm and then shoveled small stones on top."

"And thus silenced the wolf's howl?"

"Very nearly. If you stand on Wolf Rock now, you can still hear a low moaning sound as the tide comes in, but it's very faint. So far as a warning is concerned, the wolf is chained forever."

"And did the people profit by it, sir?"

"Within three months from the time of the silencing of the wolf, over thirty vessels crashed to pieces on the rocks around, and the people of the villages were made rich by the wreckage of the cargoes that came floating in, or by the plunder they took from the vessels which held together after the storm had passed."

"And those who were drowned?"

"They were drowned, that was all," the other said. "Of course if any survivors were washed ashore, the coast folk treated them very kindly."

"I don't suppose," Eric remarked, "that they ever told these survivors that they had done their best to make them the victims of the hungry sea?"

"Hardly! You've got to remember that people often have queer local ways. There are superstitions you can't defend on any ground. You know, at one time, it was considered bad luck to try to save any one who had been partly drowned. There are plenty of people, even nowadays, who won't cut down a would-be suicide who has hanged himself because they think it's bad luck.

"So far as the sea and sailors are concerned, I believe there's more humanity than on land. It's very rarely that you ever hear of a vessel that has refused to go to another's assistance. I think, too, the whole work of the Coast Guard is a standing example of the modern idea that nothing is more important than the saving of life."

"It often takes some big disaster to start it, though," said Eric. "After all, this Ice Patrol that the *Miami* is going on next month, was only begun as a result of the sinking of the *Titanic*, wasn't it?"

"That's all. But wasn't that reason enough?"

"It surely was," agreed the boy.

"I think the summer ice patrol is a mighty useful thing. If the *Seneca* keeps the lane of ocean travel free of derelicts and we cover the Ice Patrol

of that same steamship lane, it ought to make a difference in the safety of ships at sea. Ever see a big iceberg, Mr. Swift? ''

'' Heaps of them, sir,'' answered the lad. '' I was on the Bering Sea patrol last year.''

'' That's right. But you'll find the Atlantic bergs are different. There's a lot of ice in the North Pacific but it's mostly in small pans. No big stuff comes through Bering Strait. It would strand. And then the Aleutian and Kuril Islands make a sort of breakwater to head off big bergs. But in the North Atlantic there's nothing to keep the big Greenland glacier breaks from floating south right into the very path of the steamers. In fact that's what they do. You'll see some real ones this summer.''

As the lieutenant had pointed out to him, the whole ice question assumed great importance, viewed in the light of the Atlantic Ice Patrol. The *Miami,* on orders from the department, steamed north and relieved the *Seneca* on duty. She picked up the bergs which the *Seneca* had found and plotted their positions on the chart. Every day at eight bells of the middle watch (4 A.M.) the wireless operator on the *Miami* sent to the Hydrographic office a statement as to the exact position

Courtesy of U.S. Coast Guard.

ICEBERG WITH *MIAMI* IN THE BACKGROUND.

Courtesy of U.S. Coast Guard.

THE GHOSTLY ALLY OF DISASTER.

Berg in the lane of Atlantic travel, continuously watched by Coast Guard Cutter, safeguarding thousands of human lives.

of all bergs that had been sighted and the amount of their probable daily drift. This information was sent out again as a daily ice warning to merchant vessels by the Hydrographic Bureau.

The experiment of trying to demolish the larger bergs by gunnery was tried, and a six-pound shot was fired full at close range at one of the bergs. But it had no other result than to shake down a barrelful of snow-like dust. Following up the various bergs kept the *Miami* busy. At the same time she sent and received messages from passing steamers along the line of travel.

Only one large berg really got into a dangerous position, and this one was as carefully plotted and its position as thoroughly made known to vessels navigating the Atlantic as though it were a fixture. The course of the large Atlantic greyhound *La France* lay directly in the path of the berg and, had it not been for the warnings of the *Miami,* there might have been another ocean disaster to record. As the summer months approached, the cruising was delightful but not particularly interesting, and Eric, who craved excitement, was glad when, at the end of June, the *Miami* was ordered to resume her old station at Key West.

Two months passed before an emergency arose, but when it did come, it proved to be one to tax the Coast Guard cutter to the full. Toward the end of September a storm warning of a hurricane was issued, and the *Miami,* which was searching for a derelict reported two hundred miles west of Daytona, Florida, decided to run for Matanzas Inlet. About daylight the next morning, the first actual warning of the hurricane, aside from the notice sent out by the Weather Bureau, began to show itself in short gusty puffs. The barometer fell low, finally touching 28°, lower than Eric had ever seen before.

The sky clouded gradually, and by breakfast time, the wind was freshening from the southeast. By ten o'clock, the wind had risen to half a gale, and before noon it was blowing not less than forty to fifty miles an hour. The *Miami* made good weather, but in the afternoon the hurricane reached such a pitch of violence that it was decided to run before the storm and try for the lee of Cape Fear, possibly finding a safe anchorage in Masonboro Inlet.

As evening drew on the seas became appalling. The *Miami* pitched her nose down in the water, shipping it green with almost every dive, while

her propeller raced ten feet clear of water; next instant her stern would settle as though she would never rise, while the bow climbed up and up as the trough rolled underneath her. Eric, who was absolutely free of any fear of the sea, enjoyed the storm extremely. It was tiring, however, for, every second of the time, one had to hang on to something for fear either of being washed overboard, or hurled around like a catapult from a sling. When, therefore, the gaunt figure of Cape Fear light was passed and the *Miami* slipped in behind the lee of Smith Island, every one felt a relief from the mad tossing.

They had not known this relief for more than about four minutes when the spluttering of the wireless began.

"I'll bet that's some one in trouble," said Eric.

"Probably," his friend, the second lieutenant said, overhearing him. "Haven't you been expecting it?"

"Hadn't thought of it, sir," said the boy. "We'd plenty to do to get in here ourselves. Yes, there goes Mr. Keelson down to the captain. Could we find out what's up, sir?"

The two young officers sauntered to the wireless operator's cabin.

"Somebody in trouble, I suppose, Wilson," the lieutenant said.

"Yes, sir," the operator answered, "two-masted steamer *Union* reported in distress, partly dismasted and with her engines disabled, anchored in deep water off the Lookout Shoal."

"Probably dragging, sir?" queried Eric, knowing that his companion knew the coast well.

"Most likely," the lieutenant answered. "If she's off Lookout, and the wind veers round to the south'ard—which it's doing—that'll send her to Cape Hatteras and Davy Jones' locker in a hurry. We may get there in time, but there's not much we can do while this weather lasts."

"Hatteras is called the 'graveyard of ships,' isn't it?"

"There are a good many places in the world thus honored," said the lieutenant, "and, so far as America is concerned, there are two, Cape Cod and Cape Hatteras. There are five times as many wrecks between Barnegat Point and Seguin Island as there are in all the other coasts of the United States put together, but in proportion to the amount of shipping that passes, Hatteras is the worst point in the world."

"Worse than the Horn?"

"A great deal," was the reply. "Shipmasters know the dangers of Cape Horn and give it a wide berth—though steamers nowadays generally use the Straits of Magellan—but Cape Hatteras is different. It juts right out in the path of vessels running down the coast so that a ship makes almost a right angle at that point."

"It's a wonder they don't build a lighthouse out on the shoals."

"It can't be done," said the other, shaking his head. "The contract was awarded once, but the project fell through. The builder found it impossible to carry it out. There's a New York firm that has been after the Lighthouse Department for a long time to get a contract for the building of a lighthouse on the shoals of Hatteras, but it wants four million dollars, and the government thinks that a bit steep. A first-class lightship can be kept in commission on the station for a fraction of that sum."

"But is a lightship just as good?"

"N-no," the other answered dubiously, "a lightship, as such, is not as good as a lighthouse, supposing both were at the same point. But a lightship can always be placed in a more advantageous position than a lighthouse, and in places

where a lighthouse is impossible, a lightship is invaluable. I should be inclined to say that the Diamond Shoals Lightship off Cape Hatteras, the Frying Pan Shoals Lightship off Cape Fear and the Nantucket Shoals Lightship off Montauk Point would take rank as three of the most important lightships in the world."

"But I should think they would get blown off their stations every once in a while," suggested Eric.

"They do," said the other; "not very often, but they do."

"Then what happens?"

"They steam back to their station and lie to as near it as possible. At one time lightships used to be without any kind of propelling machinery, and sometimes they were driven ashore. That happened to a German lightship at the mouth of the Elbe, not so long ago, and all the crew were lost."

"The Columbia River lightship went adrift, too, I remember," said the boy; "they had to haul her back through the woods in order to get her floated again and taken to her station."

"Exactly," said his friend, "that was another case of a lightship not having her own steam.

It's not only to enable a lightship keeping to her station, or running to safety in the event of being blown off her moorings, but you can see that in a severe storm, if a lightship can steam ahead into the eye of the wind, she can take a lot of the strain off her anchors. To tell you the truth, it's my private opinion that the Diamond Shoals Lightship will need to-night every pound of steam she can get. Look for'ard!"

The lieutenant pointed with his finger. The *Miami,* starting off to help the disabled steamer in trouble, had turned her stern to the easy anchorage and safe haven not more than two miles away, and was headed for the open sea. Still under the lee of Cape Fear, the force of the wind was greatly moderated and the sea was not more than ordinarily rough. But where the lieutenant pointed, it was easy to see that the storm was raging in its full fury. The waves were running high, their crests whipped into spray by the gusts.

"You're right, sir," Eric agreed, "we're in for it! And, what's more, here it comes now!"

Almost with the word the *Miami* got into the full reach of the storm, halted, gave a convulsive stagger, than plunged into the smother. For a

minute or two no one on deck could have told what had happened. The shriek of the hurricane through her cordage, the harsh roaring of the tempest-whipped sea, and the vengeful boom of the waves as they threw their tons of water on the deck of the sturdy vessel made the senses reel.

But the engines of the *Miami* throbbed on steadily in defiance of the tempest's fury. The Coast Guard cutter, like every member of her crew, was picked for service, for stern and exalted service. Hurricanes might hurl their monstrous strength upon her, eager billows might snatch at her with their crushing gripe, shoals and reefs might hunger greedily with foam-flecked fangs, still the *Miami* plowed on through the storm. From realms unknown where the elements hold council of discord, the forces of destruction launched themselves upon her, but the white ship of rescue steadily steamed on, with her lights quietly burning and her officers and crew going about their duties in calm and perfect confidence.

Morning broke with that blue-gray veiling of the world in a covering of storm that sailors know so well. It was one of those mornings when the best of ships looks worn and drazzled. The *Miami* showed scars from her night's battle with the

tempest. One of the starboard boats had been stove in, and the davits twisted with the force of a wave that had come aboard. Even the most rigid discipline and the most perfect order failed to make the little vessel trim. There was an " out all night " appearance to the cutter which told—more than great actual damage could have done—the dogged endurance of the vessel against the fury of wind and sea.

But, down in the engine-room, the unceasing metal fingers that are the children of men's brains throbbed steadily, and the screw of the little vessel drove her on to her work of rescue. On deck, the Coast Guard men, clear-eyed and determined, handled their day's routine with a sublime disregard of the dangers of the sea. Other vessels might scurry to safe harbors, but the *Miami,* flying the colors of Uncle Sam, set out on her mission to save, with never a moment's halting.

On the *Miami* drove. Presently, the crow's-nest lookout reported a steamer. She was one of the big West Indian liners, and she came reeling towards the cutter with lurchings that were alarming to behold. Only a certain quick jauntiness of recovery told the tale that she, too, was confident

of her powers to weather the storm. She called by wireless that she had passed the disabled steamer *Union* two hours before, that the vessel was dragging her anchors and was in too shoal water for the liner to attempt a rescue.

"She's going to strike, sure," said Eric to his friend Homer, as the news of the message was received.

"And going right over the Diamond Shoals. How would you like to have charge of the *Miami* now, Eric?"

The boy looked thoughtful.

"A year or two ago," he answered, "when I was in the Academy, I'd have been tickled to death at the chance. Right now, when I think I know a bit more, I'm quite satisfied to have Keelson on the bridge. I notice the captain's been around a good bit, too."

"Our chief has been on the job below nearly all night, as well," Homer replied. "I'm thinking, Eric, that this is about as bad weather as any vessel can live through!"

On through the storm the *Miami* sped, her engine driving at its fullest speed despite the terrific strain put upon it when the vessel heaved her stern out of water and the screw raced madly

Courtesy of Scientific American.

A Rescue on the Diamond Shoals.

The Coast Guard Cutter in utmost peril, saving the lives of the crew of the wrecked steamer *Union*.

with nothing to catch. On she sped, though her bow was pointed straight for the most treacherous shoals on the Atlantic coast, bars of avid quicksand, on which thousands of vessels had gone to swift and awful destruction. On toward the Diamond Shoals the cutter pierced her way, though the gray veil of driving spray hid everything a score of fathom before the vessel's bow.

"By the deep four!" called out the leadsman, as the water shallowed.

Eric felt an uncomfortable sensation at the pit of his stomach. Four fathoms! This was within a few feet of the bottom of the vessel. If she should strike!

But the first lieutenant, unperturbed, peered out into the grayness. The boy felt an overwhelming admiration of a man who could dare to take a ship over the worst piece of coast in all the broad Atlantic, in a driving hurricane, with never a landmark or a light to guide him, and hold his nerve cool and self-assured. The captain was on the bridge, but Eric noted that he never spoke to the first lieutenant. This, the boy thought, told even more the spirit of the Coast Guard. Each man had faith in the knowledge and skill of the other.

Into the very jaws of the breakers the little cutter sped, and, even while the boy was looking fearfully on every side of him to see the curling waves breaking on shoals not a hundred feet away, there appeared before them the wrecked and disabled steamer. Over the bars the vessel had pounded, her foretopmast had gone by the board, and she seemed in hopeless case.

So powerful was the gale that it had plucked the hapless steamer out of the jaws of the sucking sand, and flung her, like a plaything, into the breakers beyond. The *Miami* slowed down, her first pause in that awful race, which was ending in the maze of the Diamond Shoals, with waves breaking on every side and a hurricane whistling overhead.

It seemed even the most reckless foolhardiness to go on a fathom further, but the first lieutenant seemed to know the bottom as though it were a peaceful lane in a New England countryside, and after the *Union,* the Coast Guard cutter crept warily. Even the boatswain muttered under his breath,

"We'll never get out o' this!"

But, foot by foot, almost, the boy thought, step

by step, the *Miami* overhauled the wrecked vessel.

Then from the long silence that had reigned on the bridge, suddenly issued a torrent of orders. The decks of the cutter seemed to bristle with men, as when Jason sowed the dragon's teeth. Eric, though quick and keen, had all he could do to fulfil the part of the work that was given him and set the crew at the lines of the breeches-buoy. Every man was on deck and every man was working with frantic haste.

In a fraction of time that seemed but a few seconds, a line was shot to the *Union,* made fast by her crew on board, the breeches-buoy was hauled out and the first of the men from the wreck was on the way to the *Miami.* All this had been done in the few minutes that passed while the cutter held herself within fifteen fathom of the schooner. Then the *Miami* dropped her anchor, to hold her place for the breeches-buoy.

Amid the scream of the gale in the rigging, and the pounding of the breakers on the shoals, the men worked like fiends. Never did ropes slip more quickly through their hands, never did sailors work more feverishly. But, in spite of this

wild and furious striving, it was evident that the *Miami* dare not hold her place. The *Union* evidently had lost one of her anchors, and the other was not holding in the sand. Every few seconds she dragged, and, in order to prevent the breeches-buoy tackle from being suddenly broken, the *Miami* had to pay out cable to keep in bearing. Each fathom of chain slipped brought her that much nearer to the shoal.

There were thirty men in the *Union's* crew and every man had been brought aboard but the captain, when the Coast Guard cutter reached the edge of the shoal. One minute more would mean success.

At that instant, a savage gust came hurtling in from sea, as though the hurricane was bound to claim at least one victim. The captain of the steamer had just thrust one leg through the breeches-buoy and the *Miami's* men, with a cheer, had started to haul him inboard, when that gust struck the wrecked vessel. It keeled her over, snapping the line of the breeches-buoy like a whip, and the captain of the steamer was jerked out into the sea.

Absolutely without thinking of what he did, reverting for the instant back to the old volunteer

life-saving work, when every man went on his own initiative, Eric tore off coat, trousers, and shoes, snatched a life-belt, and plunged into the boiling breakers.

At the same second, before even his plunge was noted, the *Miami* slipped her cable entirely, leaving chain and anchor as booty to the Diamond Shoals and clawed away from the sandbar, not more than twenty feet from her bow.

Eric, keyed to a wild and excited perception, saw the captain of the steamer in the water, a few feet away, and swam to him. He found him conscious but unable to swim, the jerk from the breeches-buoy having twisted a sinew in his thigh.

It was a half a mile to land, and the breakers rose all round them. With a blind intuition the boy struck out for shore. He knew it was no use trying to reach the ship. How long he struggled he scarcely knew, but the *Union's* captain, though in pain and crippled, was able to use his arms in swimming and, for a few minutes, from time to time, relieved the boy.

It seemed that hours passed. The chill of failure began to creep into Eric's spirits. No longer he swam with energy, but with desperation. The hand of the steamer's captain on his shoulder

grew heavier and heavier. Spots danced before his eyes.

Suddenly his comrade spoke.

"A little further, lad," he said, "a little further. They've seen us!"

And, like a great white angel on the water, the power surf-boat of the Cape Hatteras Coast Guard station came flying through the surf upon them. The two branches of the Coast Guard had combined to snatch from the graveyard of the deep its full-expected prey.

THE END

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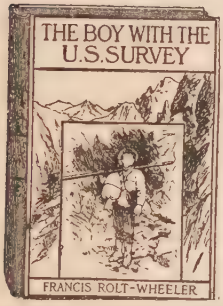

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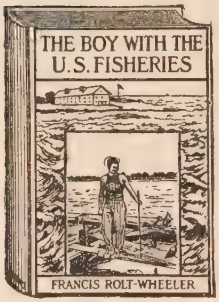

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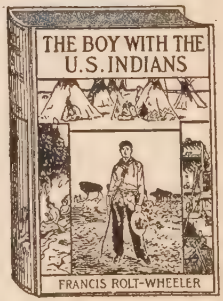

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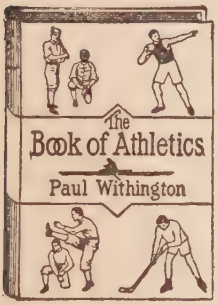

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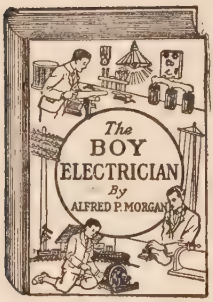

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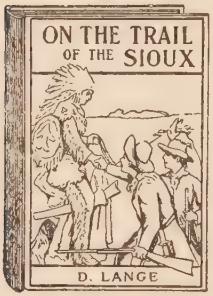

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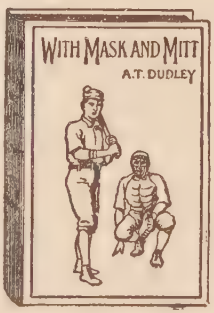

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THE Pecks are twin brothers so resembling each other that it was almost impossible to tell them apart, a fact which the roguish lads made the most of in a typical summer camp for boys.

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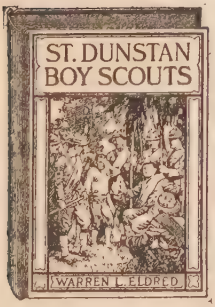

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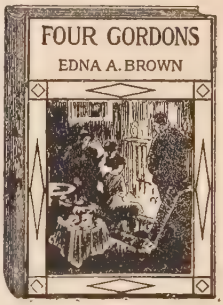

LOUISE and her three brothers are the "Four Gordons," and the story relates their experiences at home and school during the absence of their parents for a winter in Italy. There is plenty of fun and frolic, with skating, coasting, dancing, and a jolly Christmas visit. The conversation is bright and natural, the book presents no improbable situations, its atmosphere is one of refinement, and it has the merit of depicting simple and wholesome comradeship between boys and girls.

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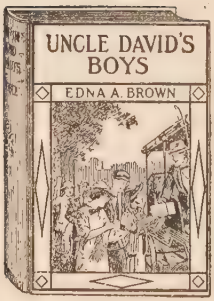

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